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August 22, 2001

Kevin Turner-Environmental Scientist, OSC
U. S. Environmental Protection Agency
C/o Crab Orchard National Wildlife Refuge
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Marion, IL 62959

Re: Sauget Sites Area I - May 31, 2000 Unilateral Administrative Order (UAO)
Sediment / Soils Removal Action
• **Containment Cell O&M Report submittal**

Dear Mr. Turner,

Pursuant to the United States Environmental Protection Agency ("USEPA") Sauget Sites Area I May 31, 2000 Unilateral Administrative Order ("UAO"), issued to Solutia Inc. and Monsanto (Solutia Inc. and Monsanto are hereinafter referred to as "Solutia"), Section V. **Order**, 3. Work to be Performed, 6. Containment Cell Design Report Requirements, D) Operations and Maintenance Plan, requiring Respondents to submit an Operations and Maintenance Plan for the Cell complying with the requirements set forth in 40 C.F.R. § 761.75(b)(8) and 40 C.F.R. § 264.303. Said Operations and Maintenance Plan is hereby submitted for Agencies' review and approval.

Sincerely,

A handwritten signature in cursive script that reads "Mike Light".

D. M. Light
Manager, Remedial Projects
Solutia Inc.

cc: (w/enclosure)

Thomas Martin, Esq. - USEPA
Michael Ribordy - USEPA
Michael McAteer - USEPA
Sandra Bron - IEPA
Linda Tape, Esq. - Thompson Coburn

Operations and Maintenance Plan

Sauget Site Area 1 TSCA Containment Cell

Villages of Cahokia and Sauget
St. Clair County, Illinois

August 23, 2001

Prepared for: **Solutia Inc.**
St. Louis, Missouri

Prepared by:



MAVERICK

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A	HEAVY EQUIPMENT SPECIFICATIONS
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1.0 Introduction

1.1 Background and History

Solutia Inc. has entered into a Unilateral Action Order (UAO) agreement with the United States Environmental Protection Agency (USEPA) to address affected sediments and soils in and adjacent to Dead Creek in Cahokia, Illinois (Figure 1). The Dead Creek sediments and soils are part of a larger Superfund Site known as Sauget Area One. A key requirement of the UAO is the removal of affected sediments from the creek and transfer to a Toxic Substances Control Act (TSCA)-compliant disposal facility.

Solutia has completed investigations and designs for the TSCA Containment Cell requirements including assessments of materials compatibility, subgrade soil properties, and evaluations of slope stability, floodplain and depth to groundwater. The disposal facility will be a newly constructed TSCA Containment Cell to be located on Solutia owned property within the area designated as CS-B. The removal of the affected sediments and soils is being performed as a Time Critical Removal Action. Details of the Operations and Maintenance of the Containment Cell (post-construction) are provided in this document.

1.2 Containment Cell Description

A double-lined, single Containment Cell has been designed to allow proper disposal of the excavated sediments and soils from the creek. The approximate capacity of the containment cell is 50,000 cubic yards (cy) and the approximate footprint is estimated to be six acres. Additional acreage will be used for construction of service roads and support areas.

The Containment Cell embankment will be constructed predominantly above existing grade with suitable earthen materials to form the cell. The Containment Cell includes specifically designed embankment, bottom liner and cover systems. Details of these systems are provided in the Sauget Area 1 TSCA Containment Cell Design Report (URS, 2001).

The exterior slopes of the embankment will be no steeper than 4H:1V and the maximum height will be approximately 20 feet. The interior slopes of the embankment will be no steeper than 3H:1V.

The bottom liner system for the Containment Cell will be a multi-component composite lining with leachate collection and leak detection layers. After the Dead Creek sediments and soils are transferred to the cell, a low permeability multi-component cover will be constructed. The cover will include a gas vent system and a composite geosynthetic lining system to reduce infiltration and subsequent leachate generation.



1.3 Waste Quantities and Description

Affected sediments and soils within Dead Creek have been characterized and defined as part of the UAO. In accordance with the UAO, the cell will be used only for disposal of sediment and soils associated with Dead Creek segments designated as Areas B, C, D, E and M. These waste materials have been characterized as containing various organic and inorganic constituents through previous investigations as described in the UAO. The current volume estimate for sediments and soils from Areas B, C, D, E and M is 50,000 cy.

1.4 Organization of Report

This O&M Plan is prepared for use by the parties responsible for operating and maintaining the Containment Cell once it is constructed and approved for waste acceptance. This O&M Plan includes a discussion of activities necessary during the active life of the cell (i.e., during waste filling activities) and post-closure (i.e., after all waste is placed and final cover system is installed).

In accordance with the UAO, the contents of this O&M Plan are a combination of site-specific needs as well as USEPA and Illinois Environmental Protection Agency (ILEPA) requirements. As this project is part of a CERCLA Time Critical Removal Action, specific permits are not required. However, where possible, appropriate regulations within Title 35 Illinois Administrative Code (35 IAC) have been followed in consideration of achieving best management practices and permit equivalency.

The Groundwater Monitoring and Corrective Action Plans which are required elements of the O&M Plan under the UAO, are currently being developed and will be submitted as a separate document.

The remainder of this report is organized as follows:

- Section 2.0 presents the Active Cell Filling Operations Plan;
- Section 3.0 details the specific Leachate and Stormwater Management Procedures;
- Section 4.0 presents Support Procedures;
- Section 5.0 outlines Equipment Descriptions and O&M;
- Section 6.0 presents Inspection and Monitoring; and,
- Section 7.0 discusses Administrative Procedures.

1.5 Other Reference Documents

Other documents noted throughout this report are summarized as follow for reference:

- Sauget Area 1 TSCA Containment Cell Design Report (URS, April 2001).
- UAO (USEPA, May 2000).
- Time Critical Removal Action Work Plan, Dead Creek Sediment and Soil (Solutia, June 2000).
- Site-Specific Health and Safety Plan (Maverick, May 2001).



2.0 Active Cell Fill Operations Plan

This section describes the site-specific procedures for active cell filling operations including management objectives, the waste acceptance criteria, working face practices, initial waste placement and subsequent lifts. Support functions including leachate and stormwater management procedures to be followed during the active period are presented in Sections 3.0 and 4.0 of this document.

2.1 General

As discussed in Section 1.3 of this report, existing Dead Creek sediment and soil materials will be excavated and placed in the newly constructed Containment Cell. Wastes will be placed in lifts. The general operational approach dictates that the lifts be placed with the following two primary objectives:

- Protection of the leachate collection system (initial waste placement); and
- Protection of the geosynthetics along interior side slopes (subsequent waste lifts).

Requirements for the sediment and soil placement are detailed in the Specification Section 02225 of the Design Report (URS, 2001). The following subsections are intended to provide a narrative of how these requirements will be implemented in the filling operations.

2.2 Waste Acceptance Criteria

In accordance with the UAO, the following minimum waste acceptance criteria will be used throughout the active filling operations of the Containment Cell:

- Metal and organic containing sediments, creek bottom soil and flood plain soil from Area One only will be placed in the Containment Cell.
- No liquids or incompatible wastes will be placed in the Containment Cell.
- Material placed in the Containment Cell will pass the Paint Filter Test.

One sample will be collected for every 5,000 cy of material placed in the Cell and will be analyzed for Target Compound List/Target Analyte List (TCL/TAL) parameters and dioxin/furans to characterize the material placed in the Containment Cell.

2.3 Method of Cell Filling

The waste placement technique to be used will incorporate use of the entire footprint of the cell. As shown on Sheet 1 Cell Layout and Details, waste hauling vehicles will use either of two access ramps located on the exterior of the southern cell embankment as directed by the cell coordinator. These waste hauling vehicles will back down the interior cell embankment ramp and will unload in the designated drop area. This drop



area will be demarcated by use of temporary barriers and will have cushioning material as shown on Sheet 1 Cell Layout and Details. Tracked equipment (excavator and dozer) will be stationed within the cell and will work in tandem to place the wastes in lifts as required. Equipment specification sheet have been included in Appendix A.

2.3.1 Initial Waste Placement

Waste filling operations shall begin at the edge of the drainage layer by carefully pushing waste out over the drainage layer. The sand drainage/cushion layer on the landfill base liner system will be maintained at all times.

To preserve the integrity of the side slope liner system, a bank of screened sediments (2" minus material) will be initially placed 2-3 feet high and 2-4 feet thick at the toe of the side slope using the excavator. Until the first lift of sediment is placed and compacted, 6" x 4' x 16' oak crane mats will be used to support the excavator.

A dozer will be used as the primary spreading machine for the initial lift layer on the cell bottom. When the initial fill layer reaches the height of this bank, another one will be constructed of screened material to protect the side slope liner system. Additionally, only hand operated compaction equipment will be used in areas closer than 2 feet from liners or other structures to obtain the densities required. Equipment will be prohibited from operating directly on liner materials or geosynthetics. Compaction of the wastes is described in Section 2.4.

The leachate collection piping has been designed to accept equipment loading (HDPE, SDR 11) and calculations were provided in the Design Report. Therefore, 35 IAC 811.321(b) (which prohibits construction, compaction and earth moving equipment from operating directly on the leachate piping system until a minimum of five feet of total material has been mounded over the system) is not applicable.

As there is no compacted clay liner, and the design includes consideration of freezing on the GCL, there is no site-specific need for a minimum frost protection layer. Waste shall not be placed over areas subject to freezing conditions until the liner has been certified or recertified by the Construction Quality Assurance (CQA) officer.

2.3.2 Subsequent Waste Lifts

After completion of the initial waste placement layer on the side slopes and cell bottom, a route of travel for subsequent lifts at the cell bottom surface will be established. Waste placement on side slopes will progress in segments of 2-4 feet in length (maximum) above the horizontal level of waste within the cell. To provide a visual reference for the equipment operators, orange cones will be placed along the bank of screened material on the side slope toe. These cones will assist the operators by providing daily width markers and in maintaining the maximum exposed face slope angles for soil and sediment placement as described in Specification 02225. The fill will be graded such that a minimum slope of two percent is maintained at all times to minimize ponding.



2.4 Physical Criteria of Waste and Compaction Requirements

The physical criteria of waste to be placed in the Containment Cell includes the following:

- Waste should not contain any free water.
- Waste should be relatively easy to place and compact. Following compaction, the waste should have sufficient strength to adequately support construction equipment working inside the landfill cell.
- Excessively soft material may be solidified in place by working the material to promote drying and/or adding quantities of dryer material to promote bulking. Solidification reagents, if needed, will meet the requirements of 35 IAC 724.414(e) and will be added/mixed via a pug mill operation and placed with the excavator.

Wastes should meet the following compaction requirements:

- Minimum undrained shear strength of 500 pounds per square foot (psf). This requirement is for both soil and sediment materials. The soil and sediment material will be placed and compacted to achieve the minimum undrained strength requirement, as measured by the pocket penetrometer or other means acceptable to the CQA officer.
- This minimum undrained shear strength requirement does not apply to the soil and sediments placed immediately adjacent to the side slope liner.

2.5 Cover Operations

As the creek sediments and soils do not exhibit putrescible or odorous conditions, the use of soil cover on a daily basis is currently not anticipated. During dry weather, the soil cover may be wetted with potable water or a surfactant to prevent dust dispersion. Additionally, a temporary impermeable liner material (Permalon™ or equivalent) may be placed on exposed wastes a part of the leachate or stormwater management described in the Sections 3.0.

2.6 Equipment Decontamination

Equipment Entering Cell

Any equipment which enters the cell and contacts the waste materials will require decontamination prior to leaving the cell. All decontamination will take place inside the cell at a decontamination station located below the crown of the berm. All wash liquids or waste water from the decontamination of each vehicle and equipment will remain within the cell to be collected in the leachate collection system and handled as described in Section 3.0.

Waste Hauling Vehicles and Equipment Outside of Cell

If a waste hauling vehicle remains outside of the cell on the perimeter access road and does not enter the cell, then decontamination of the vehicle will not be needed. The vehicle will travel onto a temporary ramp built into the berm of the cell and drop its waste load into the cell. In this manner, the waste hauling vehicle will not come into direct contact with the wastes in the cell. Vehicles unloading from outside the cell will be visually inspected for debris on the box and tires and broom cleaned as necessary prior to departure from the cell.



3.0 Leachate and Stormwater Management Procedures

There are two distinct leachate and stormwater management procedures to be used at the Containment Cell. During the active waste placement period, the containment cell will act as an open catchment and comprehensive stormwater and leachate management procedures will need to be used. After the cell is filled and the cover system installed, the expected leachate generation is expected to fall significantly and the associated management procedures are simplified. This section presents the details of the procedures to be used during the active operations and post-closure. Inspection and monitoring requirements are presented in Section 6.0.

3.1 Leachate Definitions

For purposes of this plan, "leachate" is any liquid or stormwater that:

- has been in contact with creek wastes and/or equipment used in the handling of the waste at the Containment Cell (i.e., decontamination waters);
- has been generated within the cell area (i.e., leachate which reaches the primary or secondary collection system sumps); or
- falls on the active cell area (i.e., any area that is in operation and has not received the low permeability liner or temporary cover).

3.2 Active Cell Filling Operations

3.2.1 Interior Cell Leachate Management

As described in the approved Design Report, the cell will be constructed with a hydraulically independent leachate collection system composed of a primary collection system and a secondary leak detection system. The leachate collection pipes, sumps and equipment will be tested and approved for use prior to placement of wastes. Gravity will provide the motive force for transfer of leachate from the landfill interior to the leachate sump located in the northwest corner of the cell. This system will be augmented during the active cell filling period to accommodate the potentially significant flows which will occur prior to final cover installation. These temporary improvements are described below.

During waste placement, the waste fill will be graded (minimum of 2%) to the primary leachate collection sump from which stormwater will be pumped. Perimeter run-off control ditches will be maintained within the Containment Cell. A temporary, 36-inch diameter perforated HDPE riser pipe will be installed in the gravel sump and equipped with a 5,000-gpm, float-activated submersible pump. The temporary riser pipe will be wrapped with a geotextile and surrounded with ¾-inch stone to prevent clogging. The temporary sump system will be equipped with level controls, a local alarm and an autodialer to alert the contractor of a rising sump level during off-hours. This equipment will ensure that stormwater is pumped off the waste surface as soon as practicable to resume waste placement.



To prevent unnecessary leachate generation, stormwater runoff may be discharged directly to Dead Creek off active areas which are protected with a temporary impermeable cover (Permalon or equivalent). This will likely be required during later stages of filling activities (i.e., when interior cell elevations reach the berm crest elevation). This impermeable cover will be staged along one embankment and will be deployed as necessary. The cover will only be used on wastes which have been adequately compacted and sloped to avoid ponding of water.

Calculations performed as part of the design indicate that provisions to accommodate a leachate volume of approximately 220,000 gallons (based on a 1-year, 24-hour storm event) should be incorporated into the active cell management plan. To meet the required volume storage capacity, temporary aboveground holding facilities will be used. It is anticipated that thirteen 21,000-gallon closed-top frac tanks will be staged in an area south of the cell within a PVC lined secondary containment pad and connected using a 6-inch diameter HDPE header pipe. The frac tanks will be equipped with level controls, a local alarm and an autodialer to alert the contractor of a rising level during off-hours.

The USEPA Hydrologic Evaluation of Landfill Performance (HELP) model was used in the cell design to evaluate the leachate leakage into the secondary leachate collection sump during the active filling operation. These results indicate that approximately 20,000 gallons of total leachate can be expected during a six-month construction period (or about 110 gallons per day). Based on its storage capacity, the secondary leachate collection sump will require daily checking and pump out as necessary throughout the active filling operation period. Alternatively, a 3,000 gallon secondarily-contained aboveground tank (SCAT) may be installed adjacent to the riser pipe outlet. The sump will be equipped with a dedicated submersible pump and level controls to transfer leachate to the SCAT which will also be equipped with a high level control. The controls will be tied into the local alarm and autodialer to alert the contractor of a rising level during off-hours.

The collected leachate will either be treated onsite and discharged or will be transported to a POTW for treatment. During operations of the cell both leachate and collected stormwater will be treated onsite through a 350 gallon per minute treatment system consisting of a double sand cell, four 10 micron bagfilter units and a 12,000 lb. double carbon cell unit. The treatment system will be operated on an as needed basis.

In accordance with 35 IAC 724.403 (b) and (c), the function of the collection/removal systems and the amount of liquids removed during the active life and closure of the cell will be recorded at least once each week.



3.2.2 Exterior Cell Stormwater Management

Control of stormwater runoff and management of collection and holding facilities associated with runoff and runoff control systems will be implemented.

Particular attention will be paid to the handling, control and management of stormwater during construction of the cell embankments, as well as during the active filling operation and after cover installation, to minimize leachate generation and avoid erosion and sediment deposition in drainage ways. Stormwater from tributary drainage areas will be diverted around the exterior of the cell embankments. Waterways will be provided to convey runoff from areas where the embankments act as a dam across natural drainage courses. Runoff management facilities will be regularly maintained. In accordance with 35 IAC 724.403 (b), stormwater drainage facilities will be inspected regularly and after storm events as described in Section 6.0 of this plan. Fill material, siltation and excessive plant growth will be removed from drainage waterways to prevent obstruction of flow. Erosion on the sides or bottoms of the drainage waterways will be repaired and reconstructed.

3.2.3 Decontamination Water

Decontamination procedures and protocols to be used at this site are contained in the Health and Safety Plan (Maverick, May 2001). Decontamination waters will be handled consistent with leachate procedures described in Section 3.1 above.

3.3 Post-Closure Stormwater and Leachate Management Procedures

As indicated in the Design Report, the quantity of leachate to be generated will decrease significantly after the geomembrane liner and final cover system is installed and the cell is considered closed. The level controls, and autodialer will be adjusted as necessary for the post-closure period as described below.

3.3.1 Primary Leachate Collection

In accordance with 35 IAC 724.401(a)2, high-level alarms will be installed to signal when the collection sump is approaching the 1-foot maximum operating level. The high-level alarm will consist of a level sensor installed at elevation 403.5 feet msl. A local alarm (red light annunciation) and autodialer callout will occur in the event the leachate level approaches this 1-foot maximum level in the sump. The actual elevation will be determined in the field as it is based on the as-built conditions.

As the anticipated quantity of primary leachate generated is small, it will be most efficiently removed periodically by vacuum truck or portable pumps. If the quantity of primary leachate becomes substantial, a permanent submersible pump will be installed and the secondary leachate will also be automatically transferred to the 3,000-gallon SCAT using the sump level control. The SCAT will also be equipped with a level control and tied into the autodialer to allow for periodic removal by vacuum truck or tanker. The primary leachate will be characterized and disposed off-site at the POTW or other permitted facility.



The leachate collection and pumping system will be inspected and maintained regularly as described in Section 6.0 of this report. The leachate pumps, flow meters, piping and tankage will be maintained according to the manufacturer's specifications.

3.3.2 Secondary Leachate Collection

The secondary leak detection monitoring system control, instrumentation panel and equipment will be inspected and maintained as described in Section 6.0 of this plan. Any leakage through the primary liner will be collected by gravity into the secondary sump located within the cell. Secondary level data will be collected from the leak detection sump levels indicated at the central control panel.

This data is critical in determining whether or not the primary liner system is functioning as designed. Although there are other sources of water other than leakage through the primary liner which must be considered in assessment of liquid levels and associate leachate quantities. These other sources include water collected in the secondary collection system sump is also expected to include consolidation moisture from tracked-in-place clay layer, construction stormwater and condensate liquids.

The secondary leak detection sump will be emptied periodically by pumping if liquids collect. Submersible level sensors will be installed in the side-slope riser. Any minor leakage will be removed by vacuum truck or portable pumps. If the quantity of leakage becomes substantial, a permanent submersible pump will be installed and the secondary leachate will also be automatically transferred to the 3,000-gallon SCAT. The secondary leachate will be characterized and disposed off-site at the POTW or other permitted facility.

The performance of primary and secondary leachate systems will be monitored from a monitoring panel located at the northeast corner of the cell. Initially, the following indications will be provided:

- primary pump controls;
- primary sump high and low water alarms;
- primary leachate flow indicators;
- primary leachate pump running time meters;
- secondary sump level indicators; and
- secondary sump high water alarms.



3.3.3 Temporary or Emergency Leachate Management

If temporary or emergency conditions occur that preclude the operation of the automatic leachate transfer system, a temporary pump system can be employed. The temporary pumps will operate automatically via a level sensor installed with the pump. This sensor will be equipped with a red light annunciation at the sensor control box to indicate detection. This box will be monitored as necessary for satisfactory operation. Flow rates will be monitored via vehicle transferred quantities or flow rates and running time.

3.3.4 Exterior Embankment

Once the final cover is installed and vegetation is established, sedimentation will be controlled using best management practices. Perimeter ditching and a controlled downlet structure for stormwater management are included in the design. At the confluence of the two swales located at the northwest corner of the landfill (at the top of the embankment) stormwater will flow into two interconnected drop inlets. The stormwater will then flow out of the lower inlet into a drainage ditch with discharges to Dead Creek, located east of the cell.



4.0 Support Operations Procedures

This section describes the site-specific support operations procedures for waste hauling and handling.

4.1 Waste Hauling Vehicles and Traffic Control

Vehicles for hauling waste must be suitable for transporting the waste material at the various remediation sites.

The waste haulers will not allow waste from their vehicles to contaminate the onsite roadways on which they travel. In addition, waste haulers will be responsible for observing the onsite speed limits, traffic and safety requirements.

Waste hauling vehicles should be covered, as required, to minimize dust migration during transportation. Waste hauling vehicles will follow routes designated by the Construction Manager only.

Waste hauling vehicle will track each load documenting the quantity, time loaded, and remediation site from which the waste originated. A monitor at the entry to the containment cell will stop each truck and log its arrival in the landfill records. This record will identify the location from which the waste was removed, the general appearance of the waste, and the cell into which the waste will be placed. An inventory number will be assigned to each load by the monitor. These logs will become part of the final recordkeeping as described in Section 7.0.

The monitor will then direct the vehicle to the appropriate location for unloading as described in Section 2.3

4.2 Waste Identification

The record established in the UAO identified the types of wastes that will be placed into this landfill. Additional waste sampling as described in Section 2.2 will be performed at a frequency of one every 5000 cy of material to complete the record of wastes landfilled.

4.3 Waste Surveying

As required by the UAO (reference to 40 CFR 761.75), the location of waste from the various creek segments will be documented to the extent practical. Monthly surveys utilizing a GPS unit will be conducted to document progress of the placement of waste.

4.4 Soil Erosion and Sediment Control

Erosion of cell embankment will be minimized until vegetation is established. Requirements for control devices are provided in Specification 02100 of the Design Report.



4.5 Particulate Matter and Dust Control

As there are no expected putrescible or odorous wastes, the use of daily cover or surfactant during landfill operation is currently not anticipated. In accordance with 35 IAC 811.107(g), in the event the landfill contains particulate matter which may be subject to wind dispersal, potable water will be used. If a surfactant is used, a Material Data Safety Sheet will be provided in advance. Hose bibs for potable water connections will be provide at several locations around the cell embankment to ensure complete coverage capability.

4.6 Noise Control

Since the landfill is located approximately 400 feet from the boundary of the Solutia property line, no significant impact on population due to noise exposure is expected. Therefore, no special noise controls are needed. However, noise levels for equipment used at the facility will comply with applicable OSHA requirements as described in the Health and Safety Plan.

4.7 Odor Control

Odorous constituents are not expected based upon the types of wastes identified in creek sediments and soils. Ambient air monitoring will be performed as described in the Health & Safety Plan (Maverick, May 2001).

4.8 Site Security

To minimize the possibility that wildlife or unauthorized individuals will enter the Containment Cell, an eight-foot high, barbed wire fence and lockable entrance gate has been installed at the cell perimeter. The fence will reduce the possibility for large wildlife or unauthorized individuals to enter the landfill area and potentially damaging liners, interfere with operations, come in contact with waste materials, or track waste materials outside of the cell area.

Unauthorized personnel will not be permitted in or near the landfill. During active operations, a monitor at the entrance to the landfill will stop each vehicle or person to determine whether they are permitted in the cell area. At other times the gate will be locked.

Durable warning signs will be prominently placed on the entrance gate and every 300 feet along the fence. These signs will bear, in two-inch letters, the legends; "Danger – Unauthorized Personnel Keep Out."



5.0 Equipment

The following sections describe in general the types of equipment to be used at the landfill, the functions they perform and equipment maintenance requirements.

5.1 Heavy Equipment

The heavy equipment which may be used at the Containment Cell for landfilling will include:

- bulldozers;
- front end loaders; and
- excavators.

5.2 Support Equipment

Landfill support equipment includes mobile and portable equipment (other than the heavy equipment described) used in operating and maintaining the landfill. The support equipment may include:

- trucks (dump, pickup, etc.);
- portable pumps;
- portable generator;
- portable air compressor;
- temporary light fixtures;
- rolloff containers;
- tankers;
- fuel storage tank; and,
- health and safety equipment.

5.3 Stationary Operating Equipment

Stationary operating equipment will include the equipment installed at the landfill during construction such as:

- leachate pumps and controls;
- electrical equipment;
- leachate/stormwater storage tanks;
- emergency power generating equipment;
- water hoses; and,
- hi-pressure and mist nozzles.



5.4 Equipment Maintenance Requirements

Maintenance is necessary to keep equipment in a condition that assures continuous proper operation of the assigned functions. Maintenance can be divided into three basic categories:

- Preventive Maintenance - routine work that can be accomplished with minimal or no downtime of equipment. These tasks include routine inspections, lubrication and adjustments.
- Corrective Maintenance - the non-routine repair work which may require some equipment downtime. These tasks include changing belts and replacing work bearings and brushes, etc.
- Major Overhauls - the large jobs that usually require extensive downtime. These tasks can involve considerable expenditures of money and may require additional labor.

The heavy equipment maintenance program can be divided into two major categories:

- Equipment maintenance and repair to be performed by the heavy equipment suppliers. Maintenance activities to be performed by landfill operator and/or maintenance personnel.
- Maintenance must also be performed on the support and stationary equipment. The frequency and extent of maintenance will be as recommended by the manufacturer.

Each piece of mechanical equipment on the site, from personal exposure meters to backhoes, will be inspected routinely. All emergency equipment will be regularly inspected to assure that it is present, functional and decontaminated. Whenever a problem is discovered with equipment necessary for safe landfill operation, operations will be curtailed until a satisfactory repair or replacement can be put in place.



6.0 Inspections and Monitoring

The inspection and monitoring requirements for the active cell operations and post-closure are provided in this section.

6.1 Active Cell Operations Site Inspection

In accordance with 35 IAC 724.403 (b), during active operations, the cell will be inspected a minimum of weekly and after each storm event to detect evidence of the following:

- deterioration, malfunction, or improper operation of runoff and runoff control systems;
- the presence of liquids in leak detection systems;
- proper functioning of wind dispersal control systems where present;
- the presence of leachate in and proper functioning of leachate collection and removal systems;
- procedures followed by operations and maintenance staff; and
- the condition of the operating equipment, including earth moving equipment, alarms and pumps.

An inspection check-off form with explanations of observations made will document each of these weekly inspections and become part of the landfill records.

Elements of the landfill cell will be inspected daily. These daily inspections, however, may not result in written documentation unless problems are found. Daily visual inspections of the control and instrumentation panel will cover:

- the presence of liquids in leak detection systems;
- proper functioning of leachate collection and removal systems; and
- the condition of the alarms, pumps, and control panels.

Other daily visual inspections will include:

- the condition of the operating equipment including earth moving equipment;
- the presence or absence of spilled materials in the loading, unloading areas;
- the condition of above-grade leachate transfer piping to SCAT;

The CQA Inspector will immediately notify the Construction Manager about conditions requiring corrective action.



6.2 Active Cell Leachate Collection System Monitoring

During active cell operation and until final closure, leachate will be collected through the primary and secondary leachate collection system and pumped to the abovegrade holding tanks as described in Section 3.0.

In accordance with the 40 CFR 761.75(b)7, the parameters for primary and secondary leachate sampling will include PCBs, pH, Specific Conductance, and chlorinated organics. All primary and secondary leachate sampling and analysis results will be maintained as part of the cell's records as described in Section 7.0.

6.3 Post-Closure Plan

This post-closure section addresses the requirements for post-closure care of the Containment Cell. In accordance with the UAO, post-closure care includes inspection, monitoring, maintenance plan elements as well as requirements for deed notice and certification.

In accordance with 35 IAC 724.218(a), this post-closure plan satisfies the requirements of a written plan.

In accordance with 35 IAC 724.218(b)(1) through (3), this post-closure plan identifies the activities that will be completed after the closure of the landfill and the associated frequencies as follows:

- A description of the planned monitoring activities and frequencies that will be performed during the post-closure care period. The Groundwater Monitoring and Corrective Action Program Plans that are required per the UAO (in accordance with 40 CFR 264, Subpart F and 35 IAC 724, Subpart F) are being developed and will be submitted under separate cover.
- A description of the planned maintenance activities and frequencies that will be performed to ensure: a) the integrity of the cap and final cover; and b) the function of the monitoring equipment.
- The name, address, and phone number of the person or office to contact about the hazardous waste landfill during the post-closure care period is:

Mike Light
Solutia, Inc.
P.O. Box 66760
St. Louis, MO 63166-6760
(314) 674-1617



Until final closure of the facility, a copy of the approved post-closure plan will be furnished to the agency upon request. After final closure has been certified, the above-designated contact will keep the approved post-closure plan for the remainder of the post-closure monitoring period.

In accordance with 35 IAC 724.218 (d), if necessary, the owner may submit a written request for modification of the approved post-closure plan. The written notification or request will include a copy of the amended post-closure care plan for review or approval by the agency.

6.3.1 Post-Closure Care Period

In accordance with 35 IAC 724.217(a)1, the post-closure care period for the landfill will begin as soon as the cell is certified as closed and will continue for 30 years.

This post-closure care period may be shortened or extended in accordance with provisions outlined in 35 IAC 724.217(a)2.

6.3.2 Future Use of Property and Notice in Deed

In accordance with 35 IAC 724.217(c), post-closure use of property on which hazardous wastes remain will never be allowed to disturb the integrity of the final cover, liners, or any other components of the containment system, or the function of the monitoring systems, unless the agency finds that the disturbance:

- Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or
- Is necessary to reduce a threat to human health or the environment.

In addition, Solutia will initiate a formal notice to the deed that will in perpetuity notify any potential purchaser of the property that:

- The land has been used to manage hazardous wastes;
- Its use is restricted; and
- The survey plat and record of the type, location and quantity of hazardous wastes disposed of within each cell or area of the facility has been filed with the County Recorder.

Within 60 days after the landfill closure certification, Solutia will submit a copy of the notice or notation recorded in the deed to the facility property to the County Recorder, any local zoning authority or the authority with jurisdiction over local land use and to the IL EPA. Additionally, Solutia will submit a certification to the IL EPA that the owner or operator has properly recorded this certification, including a copy of the document in which the notation has been placed.



6.3.3 *Certification of Completion of Post-Closure Care*

In accordance with 35 IAC 724.220, no later than 60 days after completion of the established post-closure care period, the owner or operator will submit to the agency, by registered mail, a certification that the post-closure care period for the landfill cell was performed in accordance with the approved post-closure plan. The certification will be signed by the owner or operator and an independent registered professional engineer. Documentation supporting the independent professional engineer's certification will be furnished to the agency upon request until the agency releases the owner or operator from the financial assurance requirements for post-closure care.

The independent engineer may have to rely on up to 30 years of documentation in completing this certification. Therefore, at a minimum, the owner should maintain the inspection reports performed by the owner or other independent parties, field reports documenting inspections, and in-house records such as laboratory analyses, contractor's logs, so that appropriate documentation will be available for review at the time of certification.

6.3.4 *General Post-Closure Care Requirements*

In accordance with 35 IAC 724.217 through 724.220, the owner or operator will:

- Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
- Continue to operate the leachate collection and removal system until leachate is no longer detected;
- Maintain and monitor the leachate detection system in accordance with 35 IAC 724.401(c)(3)(D) and (c)(4) and 724.403(c), and comply with applicable requirements of 35 IAC 724.410;
- Maintain and monitor the groundwater monitoring system and comply with applicable requirements of Subpart F of this part;
- Prevent run-on and run-off from eroding otherwise damaging the final cover; and
- Protect and maintain surveyed benchmarks used in complying with 35 IAC 724.409.

6.3.5 *Post-Closure Inspection Plan*

Post-Closure inspections, similar to the active cell operations inspections described in Section 6.1, will be conducted on the cell and associated equipment to detect malfunctions, deterioration and other conditions which could require corrective action.



Each inspection will be recorded on a permanent inspection log and include information such as the inspection date and time, name of inspector, notation of observations, date and nature of remedial action taken. These inspection logs are critical in providing the post-closure case history necessary for reporting purposes. A sample inspection log is presented as Table 1.

6.3.6 *Post-Closure Monitoring Plan*

In addition to routine inspections, the post-closure monitoring will include groundwater and leachate monitoring. The Groundwater Monitoring Plan is being developed separately and will be submitted under a separate cover. The leachate monitoring will be performed at the same frequency. In accordance with the 40 CFR 761.75(b)7, the parameters for primary and secondary leachate sampling will include PCBs, pH, Specific Conductance, and chlorinated organics. All primary and secondary leachate sampling and analysis results will be maintained as part of the cell's records as described in Section 7.0.

A sample monitoring schedule is provided as Table 2.

6.3.7 *Post-Closure Maintenance Plan*

Post-closure maintenance includes both preventative and corrective maintenance. Preventative maintenance will consist routine activities and will be completed as soon as practical. Corrective maintenance will be conducted on a priority basis as needed to preclude further malfunction.

Records of maintenance activities will be kept with the inspection logs. A sample maintenance schedule is provided as Table 3.



7.0 Administrative Requirements

This section presents the administrative requirements of the active and post-closure operating periods.

7.1 Recordkeeping

7.1.1 Operations and Maintenance

Direct operation and maintenance activities, as described throughout this report, are the responsibility of Maverick Construction Management Services, Inc (Maverick). The major responsibilities of Maverick during operation of the landfill are to:

- operate and coordinate all waste disposal into the TSCA Landfill cell;
- ensure that all applicable health and safety protocols are followed in accordance with the approved plan;
- ensure that all personnel are properly trained for landfill operations;
- maintain records of waste transporting vehicles' arrival and departure time;
- maintain records of methods of placement and location within the landfill cell as detailed in Section 4.3;
- maintain records of vehicle inspections at the time of arrival and before departure;
- ensure waste is placed in accordance with procedures described in this O&M plan;
- ensure that proper decontamination procedures are implemented;
- manage leachate including any ponded liquid on each truckload of waste observed at the gate entrance;
- divert all stormwater along middle and peripheral berms away from waste material within the cell;
- maintain records of applicable inspections outlined in Section 6.0 of this plan;
- perform any corrective measures required as a result of these inspections;
- perform routine maintenance on equipment;
- attain all required record survey information;
- control potential traffic congestion at the landfill;
- provide information to Solutia such that incident and annual reports may be written;
- maintain site dust and erosion control throughout the duration of landfill operations;
- ensure that large liner wrinkles are spread out satisfactorily;
- perform paint filter tests at the TSCA Landfill as required; and
- place temporary cover materials over waste material as required.



7.1.2 *Quality Assurance*

Construction Quality Assurance (CQA) is the responsibility of Golder Associates, Inc. (Golder). The Construction Quality Assurance Inspector (CQAI) will:

- perform in-place strength tests using a pocket penetrometer and/or torvanes, at a testing frequency of one test per 1,000 cy of in-place compacted waste;
- determine if a paint filter test is required prior to placement in the cell; and
- observe and record, for future documentation in the TSCA Landfill CQA Certification Report, waste placement and lift development information.

This information shall include:

- ramp location and condition for liner protection;
- grid placement record;
- location of any temporary collection basins;
- location of waste setback at the berms;
- location of the perimeter drainage trench;
- certification that a 2% grade on the surface of the cell was maintained;
- certification that ponding was avoided; and
- certification that no large liner wrinkles developed during waste placement.

Survey information showing as-built elevations will be provided by survey personnel for incorporation into the certification report and Record Drawings.

7.2 **Operating Record**

A written operating record as required by 35 IAC 724.173 will be kept and maintained until closure of this landfill. The operating record will include the following information:

1. Description and Quantity of Waste.
2. Location of Waste Within Landfill.
3. Records and Results of Waste Analyses. As explained in the waste analysis plan prepared for this facility, all wastes will have been analyzed and characterized prior to their being placed into this landfill. For this reason, there will be no waste analyses results or records to maintain under this requirement, therefore, this requirement is not applicable.
4. Summary Reports and Details of Contingency Plan Incidents.
5. Records and Results of Inspections. As required by 40 CFR 264.15(d), the inspection logs must be kept for at least three years from the date of inspection.
6. Monitoring, Testing, or Analytical Data Records.
7. Closure and Post-Closure Cost Estimates.
8. Annual Certification.



7.3 Availability of Records

All records, including plans, will be kept at the facility and furnished upon request. These records will be made available at reasonable times for inspection by officers, employees or representatives of the department who are designated by the commissioner as required.

7.4 Retention of Records

The retention period for all records will be extended automatically during the course of unresolved enforcement action regarding this landfill or as requested by the commissioner.

7.5 Submission of Records

A copy of the recorded waste disposal locations and quantities will be submitted to the commissioner upon closure of the facility as required.

7.6 Annual Report

Solutia will prepare and submit two copies of an annual report to the commissioner by March 1 of each year as required. The report form and instructions designated by the commissioner will be used for this report. The report will cover facility activities during the previous calendar year and will include the following information:

- the landfill USEPA identification number, name, and address;
- the calendar year covered by the report;
- a description and the quantity of each hazardous waste the facility received during the year;
- the method of disposal for each hazardous waste;
- groundwater monitoring data;
- the most recent closure and post-closure cost estimates; and
- signature of the landfill owner.

7.7 Additional Reports

In addition to submitting the annual report, the Solutia will submit appropriate notices as required by the UAO.

7.8 Personnel Training

Solutia will utilize appropriately trained personnel to operate and maintain the landfill.

7.9 Worker Safety Programs

Operations at this Containment Cell will comply with the health and safety procedures established by the site-specific Health and Safety Plan.

Table 1. Sample Inspection Log

Inspector's Name

Weather

Temperature

Cell:

Inspector's Signature

Date:

Time Begin:

Time End:

Sheet: of:

Specific Item to Inspect	Typical Problems Encountered	Observations Made	Comments or Corrective Action(s) Implemented and Dates
Final Cover and Vegetation	Erosion Vegetation deterioration Settling Ponding Uplift Washouts Leachate		
Berms	Erosion Cracking Settling Ponding Leaking		
Surface Water Control System: ditches, culverts, pipes, retention basins, risers	Obstructions Bank Erosion Ponding Vegetation Stress Scouring Siltation Deterioration		
Primary Leachate Collection System: pipes, manholes and covers, pumps, control panel, flowmeters and sensors, alarms, fittings	Obstructions Presence of leachate Leaking fittings Deterioration LEL and O ₂ levels in manholes Malfunction	Flowmeter Reading: _____ SCAT Level: _____	
Secondary Leachate Collection System: pipes, manholes and covers, pumps, control panel, flowmeters and sensors, alarms, fittings	Obstructions Presence of leachate Leaking fittings Deterioration LEL and O ₂ levels in manholes Malfunction	Flowmeter Reading: _____ SCAT Level: _____	
Above Ground Leachate Collection System: pipes, fittings, manholes and covers, control panel, sensors, alarms	Obstructions Leaking fittings Deterioration Malfunction	Flowmeter Reading: _____ SCAT Level: _____	
Access Road	Potholes Ponding Deterioration Washouts		

Table 1. Sample Inspection Log

Inspector's Name

Weather

Temperature

Cell:

Inspector's Signature

Date:

Time Begin:

Time End:

Sheet: of:

Specific Item to Inspect	Typical Problems Encountered	Observations Made	Comments or Corrective Action(s) Implemented and Dates
Site security system: fence, gate, locks, signs	Corrosion Tampering Deterioration Damage Rusting		
Benchmarks	Deterioration Damage		
Groundwater Monitoring Well System (Above grade): well casing, protective casing, cover, concrete foundation, lock	Tampering Corrosion Deterioration Damage Rusting Obstructions		
Passive gas vents	Tampering Corrosion Deterioration Damage Rusting Obstructions		
Landfill Operations Equipment	Operational condition Corrosion Deterioration Damage Fuel Tires		
Health and Safety Equipment and Emergency Equipment	Operational condition		
Miscellaneous Malfunctions, deterioration, discharges, releases into the environment			

Table 2. Schedule for Post-Closure Inspections

Specific Item	Type of Maintenance	Frequency							Visual	Written Log *	Notes
		Daily	Weekly	Monthly	Quarterly	Biannually	Annually	After Major Storms			
Final Cover and Vegetation	Erosion Vegetation deterioration Settling Ponding Uplift Washouts				● ● ● ● ● ●			● ● ● ● ● ●	● ● ● ● ● ●	● ● ● ● ● ●	
Berms	Erosion Cracking Settling Ponding Leaking				● ● ● ● ●				● ● ● ● ●	● ● ● ● ●	
Surface Water Control System: ditches, culverts, pipes, retention basins, risers	Obstructions Bank Erosion Ponding Vegetation stress Scouring Siltation				● ● ● ● ● ●				● ● ● ● ● ●	● ● ● ● ● ●	
Primary Leachate Collection System: pipes, manholes and covers, pumps, control panel, flowmeter and sensors, alarms, fittings	Obstructions Presence of leachate Leaking Deterioration LEL and O ₂ levels in manholes Malfunction			● ● ● ● ● ●	● ● ● ● ● ●				● ● ● ● ● ●	● ● ● ● ● ●	Control Panel and Autodialer will allow daily monitoring of critical features.
Sec Leachate Collect System: pipes, manholes and covers, pumps, control panel, flowmeters and sensors, alarms, fittings	Obstructions Presence of leachate Leaking Deterioration LEL and O ₂ levels in manholes Malfunction			● ● ● ● ● ●	● ● ● ● ● ●				● ● ● ● ● ●	● ● ● ● ● ●	Control Panel and Autodialer will allow daily monitoring of critical features.
Above Ground Leachate Collection System: pipes, fittings, manholes and covers, control panel, sensors, alarms	Obstructions Leaking Deterioration			● ● ●					● ● ●	● ● ●	Control Panel and Autodialer will allow daily monitoring of critical features.

Table 2. Schedule for Post-Closure Inspections

Specific Item	Type of Maintenance	Frequency								Visual	Written Log *	Notes
		Daily	Weekly	Monthly	Quarterly	Biannually	Annually	After Major Storms				
Access Road	Potholes Ponding Deterioration Washouts					●		●	●	●		
Site security system: fence, gate, locks, signs	Corrosion Tampering Deterioration Damage Rusting					●			●	●		
Benchmarks	Deterioration Damage						●		●	●		
Groundwater Monitoring Well System (Above grade): well casing, protective casing, cover, concrete foundation, lock	Tampering Corrosion Deterioration Damage Rusting Obstructions				●				●	●		
Passive gas vents	Tampering Corrosion Deterioration Damage Rusting Obstructions						●		●	●		
Landfill Operations Equipment	Operational condition Corrosion Deterioration Damage Fuel Tires										Not Applicable	
Health and Safety Equipment and Emergency Equipment	Operational condition										On an as-needed basis	

* On a monthly basis unless problems are discovered

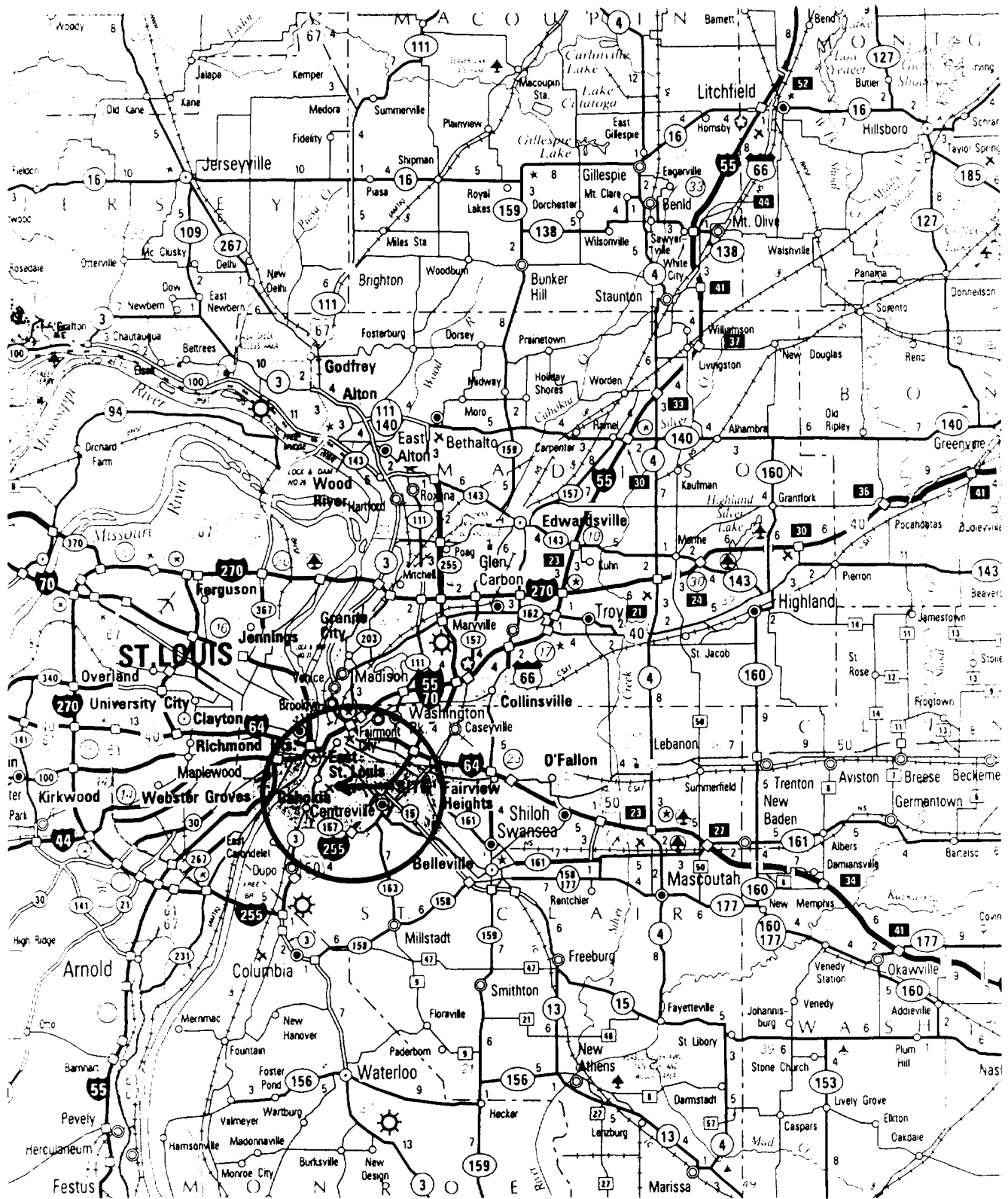
Table 3. Schedule for Post-Closure Maintenance

Specific Item	Type of Maintenance	Frequency							Notes
		Daily	Weekly	Monthly	Quarterly	Biannually	Annually	After Major Storms	
Final Cover and Vegetation	Mowing Reseeding Fertilizing Regrading Backfilling						• • • • •	• • • • •	
Berms	Regrading Backfilling						• •	• •	
Surface Water Control System: ditches, culverts, pipes, retention basins, risers	Repairing Replacement Clearing Cleaning Reseeding Dredging						• • • • • •	• • • • • •	Activity and frequency will be as needed.
Primary Leachate Collection System: pipes, manholes and covers, pumps, control panel, flowmeter and sensors, alarms, fittings	Leachate removal Cleaning Repairing Calibration			•			• • •	• • • •	Refer to specific equipment catalogues
Secondary Leachate Collection System: pipes, manholes and covers, pumps, control panel, flowmeters and sensors, alarms, fittings	Leachate removal Cleaning Repairing Calibration			•	• • • •	•		• • • •	Refer to specific equipment catalogues
Above Ground Leachate Collection System: pipes, fittings, manholes and covers, control panel, sensors, alarms	Cleaning Repairing Calibration				• • •			• • •	Refer to specific equipment catalogues
Service Road	Clearing Regrading Backfilling						• • •	• • •	

Table 3. Schedule for Post-Closure Maintenance

Specific Item	Type of Maintenance	Frequency							Final Report *	Notes
		Daily	Weekly	Monthly	Quarterly	Biannually	Annually	After Major Storms		
Site security system: fence, gate, locks, signs	Repairing Replacement						●		● ●	
Benchmarks	Repairing Surveying						● ●		● ●	
Groundwater Monitoring Well System (Above grade): well casing, protective casing, cover, concrete foundation, lock	Repairing Replacement						●		● ●	
Passive gas vents	Repairing Replacement						● ●		● ●	
Landfill Operations Equipment									●	Refer to specific equipment catalogues
Health and Safety Equipment and Emergency Equipment									●	Refer to specific equipment catalogues

* At completion of maintenance activity(ies).



Operations & Maintenance Plan
August 2001

Sauget Area 1 TSCA Containment Cell
St. Clair County, IL

FIGURE 1 - Site Location Map

1

Figure 2



PR

CELL LAYOUT AND DETAILS

SAUGET AREA 1

CAHOKIA, ILLINOIS

SCALE: 1" = 100'

May 14, 2001

DESIGNED BY: JAF

DRAFTED BY: AAT

CHECKED BY:

FILE: Cellayout.Dwg

SHEET NO.

1

PROJECT: SAUGET

SHEET 1 OF 1



Appendix A

D5M

Track-Type Tractor

CAT[®]



XL & LGP

Cat[®] 3116 turbocharged diesel engine

Power shift

Gross horsepower	90 kW	121 HP
Flywheel horsepower	82 kW	110 HP

Operating weight

XL arrangement

Power shift	12 250 kg	27,006 lb
-------------	-----------	-----------

LGP arrangement

Power shift	13 100 kg	28,880 lb
-------------	-----------	-----------

Blade capacity

XL arrangement	2.59 m ³	3.37 yd ³
LGP arrangement	2.03 m ³	2.64 yd ³

Engine

Four-stroke cycle, six cylinder 3116 turbocharged diesel engine.

Ratings at 2100 RPM*	kW	HP
Gross power	90	121
Net power	82	110

The following ratings apply at 2100 RPM when tested under the specific standard conditions for the specified standard:

NET POWER	kW	HP	PS
Caterpillar	82	110	—
ISO 9249	82	110	—
EEC 80/1269	82	110	—
SAE J1349	82	110	—
DIN 70020	—	—	114

Dimensions

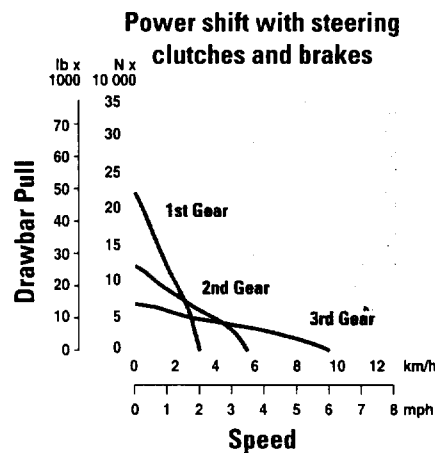
Bore	105 mm	4.13 in
Stroke	127 mm	5.0 in
Displacement	6.6 liters	403 cu in

*Power rating conditions

- based on standard air conditions of 25°C (77°F) and 99 kPa (29.32 in Hg) dry barometer
- used 35° API gravity fuel having an LHV of 42 780 kJ/kg (18,390 Btu/lb) when used at 30°C (86°F) [ref. a fuel density of 838.9 g/L (7.001 lb/U.S. gal)]
- net power advertised is the power available at the flywheel when engine is equipped with fan, air cleaner, muffler and alternator
- no derating required up to 2300 m (7500 ft) altitude

Features

- direct injection fuel system with individual adjustment-free unit injectors
- 3-ring forged steel crown pistons with aluminum skirts.
- heat resistant sil-chrome steel intake and stellite-faced exhaust valves
- forged steel connecting rods
- one-piece cylinder head designed with cast intake manifold
- cast cylinder block with oil cooler cavity cast into block
- induction-hardened, forged crankshaft that is dynamically balanced
- direct electric 24-volt starting and charging system
- two 12-volt, 100 amp-hour, 750 CCA, maintenance-free batteries
- 70-amp alternator
- plate-type, water-cooled oil cooler
- vertical-flow, steel-fin, tube-type radiator
- dry-type, radial-seal air cleaner with primary and secondary elements



Transmission

Three-speed planetary power shift, remotely mounted from engine.

Speeds with power shift transmission approximate

		km/h	MPH
Forward	1	3.27	2.03
	2	5.81	3.61
	3	9.93	6.17
Reverse	1	4.01	2.49
	2	7.09	4.41
	3	12.06	7.49

Weight (approximate)

Shipping weight

Includes VPAT blade, three-valve hydraulic control, lubricants, coolant, ROPS canopy, track end guiding guards, rigid drawbar, forward warning horn, precleaner, 5% fuel, decelerator and standard shoes.

	XL		LGP	
Power shift	12 000 kg	26,455 lb	12 850 kg	28,329 lb

Operating weight

Includes above plus operator and full fuel tank.

	XL		LGP	
Power shift	12 250 kg	27,006 lb	13 100 kg	28,880 lb

Final Drive

Single reduction final drives.

Features

- isolated from ground-impact and blade-induced loads
- modular design reduces removal and installation time
- segmented sprocket simplifies replacement

Hydraulic Controls

Load-sensing, variable displacement piston pump.

Pump output at 2200 pump RPM (2100 engine RPM) and maximum pressure
95.0 liters/min 25 gpm

Relief valve setting

XL and LGP 20 685 kPa 3000 psi

Control positions

- lift cylinders — raise, hold, lower, float
- tilt cylinder — left, right, hold
- angle cylinders — left, right, hold
- ripper cylinder — raise, hold, lower

Steering and Braking

Choice of Lever Steering or Finger Tip Control System meets SAE J1026 APR90.

Features — Lever steering

- hand-lever steering/braking controls
- oil-cooled, hydraulically actuated multiple-disc steering clutches and brakes
- single brake pedal brakes both tracks without disengaging steering clutches
- mechanically actuated, spring applied parking brake

Features — Finger Tip Control

- Finger Tip Control of transmission and steering clutches and brakes
- oil-cooled, electro-hydraulically actuated multiple-disc steering clutches and brakes
- single brake pedal brakes both tracks without disengaging steering clutches
- electro-hydraulically actuated, spring applied parking brake

Cab

Caterpillar cab and Rollover Protective Structure (ROPS). ROPS canopy required in U.S.A.

Features

- meets OSHA and MSHA limits for operator and sound exposure with doors and windows closed (according to ANSI/SAE J1166 JUL87)
- ROPS meets the following criteria:
 - SAE J395
 - SAE J1040 APR88
 - ISO 3471-1 1986
 - ISO 3471-1 1994
- also meets the following criteria for Falling Objects Protective Structure:
 - SAE J231 JAN81
 - ISO 3449 1992 Level II

Note

When properly installed and maintained, the cab offered by Caterpillar, when tested with doors and windows closed according to ANSI/SAE J1166 MAY90, meets OSHA and MSHA requirements for operator sound exposure limits in effect at time of manufacture. The operator sound pressure level is 77 dB(A) when measured per ISO 6394 and 79 dB(A) when measured per ISO 6396.

Pivot Shaft and Equalizer Bar

Pivot shaft and pinned equalizer bar oscillation system.

Features

- pivot shaft transmits ground impact loads directly to main frame
- protects power train components
- pinned equalizer bar keeps track roller frame in proper alignment
- system provides smooth machine underside
- prevents collection of mud and debris

Heavy Duty Sealed and Lubricated Track

Heavy duty design for superior track life.

Features

- improved sealability and link rail wear life
- wider bushing strap provides improved bushing retention and resistance to bore stretching and cracking
- wider pin boss and longer pin improves pin-to-link retention
- more rail material increases link and roller system wear life
- extends undercarriage maintenance intervals
- reduces overall undercarriage operating costs
- Heavy Duty track and Moderate Service shoes standard on both XL and LGP arrangements

Service Refill Capacities

	Liters	Gallons
Fuel tank	218	57.6
Crankcase and filter	26	6.9
Transmission, bevel gear and steering clutch (includes torque converter or oil clutch)	105	27.7
Final drive (each side)	6	1.6
Cooling system	46	12
Implement hydraulic system (includes tank)	67	17.7
Hydraulic tank	32	8.5
Recoil spring compartments (each side)	20	5.3

Winch

Rugged PA55 winch with freespool.*

Features

- hydraulically actuated multiple-disc wet clutch and brake
- single lever control of clutch and brake functions
- separate lever for freespool operation
- standard or slow speed

Weight	1276 kg	2814 lb
Winch length	1120 mm	44.1"
Winch case width	975 mm	38.4"
Flange diameter	504 mm	19.8"
Drum width	330 mm	13"
Drum diameter	254 mm	10"
Cable size:		
Recommended	16 mm	0.63"
Optional	19 mm	0.75"
Drum capacity:		
Recommended cable	177 m	580'
Optional cable	122 m	400'
Oil capacity	74 L	19.6 gal
Cable/ferrule sizes (OD x length)		
54 mm X 65 mm	2.13" X 2.56"	

*PA55 winch is manufactured for Caterpillar by PACCAR Inc.

Track Roller Frame

Tubular design resists torsional loads.

Features

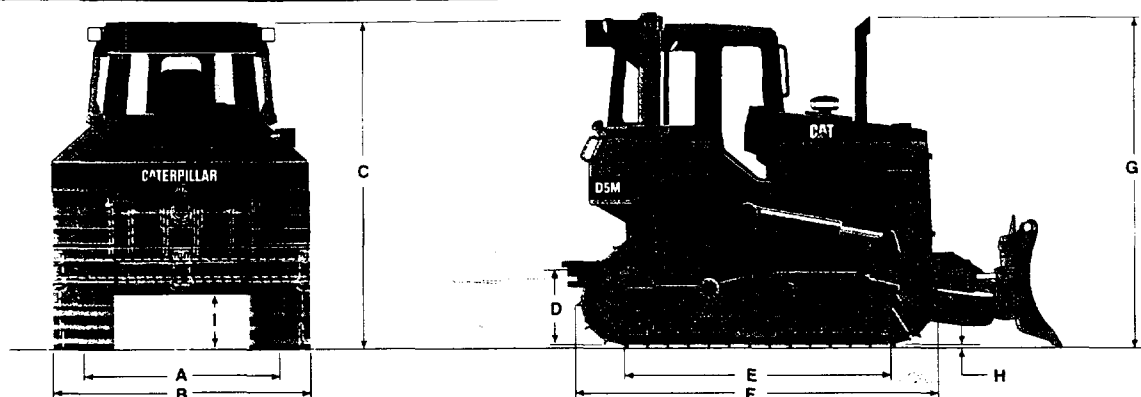
- Lifetime Lubricated rollers and idlers are directly mounted to roller frame
- oscillating roller frames attach to tractor by pivot shaft and pinned equalizer bar
- large pivot bushings operate in an oil reservoir
- equalizer bar saddle connection is low-friction bushing with remote lube line
- recoil system fully sealed and lubricated

	XL		LGP	
Oscillation:				
front and rear idlers at gauge line (total)	218 mm	8.6"	280 mm	11.0"
at pivot shaft	±2.6°		±3.1°	
Number of rollers (each side)	7		7	
Number of shoes (each side)	41		44	
Width of:				
standard shoes	560 mm	22"	760 mm	30"
optional shoes	510 mm	20"	—	
optional shoes	—		610 mm	24"
self-cleaning shoes	—		770 mm	30"
Length of track on ground	2388 mm	94"	2604 mm	103"
Track gauge	1770 mm	70"	2000 mm	79"
Ground contact area with:				
510 mm (20") shoes	2.44 m ²	3775 in ²	—	
560 mm (22") shoes	2.67 m ²	4146 in ²	—	
610 mm (24") shoes	—		3.18 m ²	4924 in ²
760 mm (30") shoes	—		3.96 m ²	6135 in ²
self cleaning 770 mm (30") shoes	—		4.01 m ²	6216 in ²
Ground Pressure*:				
510 mm (20") shoes	0.50 kg/cm ²	7.05 psi	—	
560 mm (22") shoes (std)	0.46 kg/cm ²	6.51 psi	—	
610 mm (24") shoes	—		0.41 kg/cm ²	5.76 psi
760 mm (30") shoes (std)	—		0.33 kg/cm ²	4.70 psi
self cleaning 770 mm (30") shoes	—		0.33 kg/cm ²	4.77 psi

*Ground pressure is calculated for machine equipped with Heavy Duty (HD) tracks, and Moderate Service (MS) Shoes.

Dimensions

(approximate)



Tractor Dimensions

	XL		LGP	
A. Track gauge	1770 mm	70"	2000 mm	79"
B. Width of tractor, with standard shoes and the following blades:				
Without blade	2330 mm	92"	2760 mm	109"
With VPAT blade, angled 25°	2797 mm	110"	3106 mm	122"
With special narrower VPAT blade, angled 25°	2615 mm	103"	3066 mm*	120.7"
C. Machine height from tip of grouser with the following equipment:				
ROPS canopy	2999 mm	118"	3043 mm	120"
ROPS cab	3002 mm	118"	3046 mm	120"
D. Drawbar height (center of clevis) from				
ground face of shoe	486 mm	19"	537 mm	21"
E. Length of track on ground	2388 mm	94"	2604 mm	103"
F. Length of basic tractor (with drawbar)	3544 mm	140"	3720 mm	146"
With the following attachments, add to basic tractor length:				
Ripper	898 mm	35"	898 mm	35"
PA55 winch	381 mm	15"	381 mm	15"
VPAT blade, straight	1011 mm	39"	1402 mm	55"
VPAT blade, angled 25°	5086 mm	200"	5557 mm	219"
Special narrower VPAT blade, angled 25°	4938 mm	194"	5539 mm	218"
G. Height over stack from tip of grouser	3082 mm	121"	3126 mm	123"
H. Height of grouser	55 mm	2.17"	47 mm	1.85"
I. Ground clearance from ground face of shoe (per SAE J1234)	385.5 mm	15.2"	437.5 mm	17.2"

Bulldozer Specifications

	(XL) 5VPAT Blade		(LGP) 5VPAT Blade	
Blade capacity (SAE J1265)	2.59 m ³	3.37 yd ³	2.03 m ³	2.64 yd ³
Blade width (over end bits)*	3077 mm	121"	3360 mm	132"
Blade height	1109 mm	43.7"	910 mm	35.8"
Digging depth	441 mm	17.4"	491 mm	19.3"
Ground clearance	916 mm	36.1"	923 mm	36.3"
Maximum tilt	460 mm	18.1"	491 mm	19.3"
Weight (without hyd. controls)	1932 kg	4259 lb	2000 kg	4409 lb
Total operating weight (with blade)	11 700 kg	25,800 lb	12 600 kg	27,800 lb

*Narrower 5VPAT blade is available for applications with 3000 mm (118") transportation width restriction. Contact Custom Products.

Ripper

Multi-shank design with three curved shanks to match job conditions.

	XL		LGP	
Beam width	1951 mm	76.8"	1951 mm	76.8"
Cross section	165 x 211 mm	6.5 x 8.3"	165 x 211 mm	6.5 x 8.3"
Ground clearance under beam (raised)	895 mm	35.2"	949 mm	37.4"
(Under tip at full raise)	482 mm	19.0"	536 mm	21.1"
Number of pockets (teeth)	3		3	
Max. penetration	350 mm	13.8"	298 mm	11.7"
Max. pryout force	191 260 N	42,165 lb	192 600 N	42,461 lb
Max. penetration force				
(VPAT blade equipped — power shift)	40 100 N	8840 lb	46 690 N	10,293 lb
Weight				
With three teeth	758 kg	1671 lb	758 kg	1671 lb
Each tooth	34 kg	75 lb	34 kg	75 lb

Note: Straight shanks are also available.

Standard Equipment

Standard and optional equipment may vary. Consult your Caterpillar dealer for specifics.

Air cleaner, dry-type, with precleaner	Electric hour meter	Lockable storage compartment
Air cleaner service indicator	Electric starting, 24-volt direct	Mirror, rearview
Air intake heater	Engine, 3116 turbocharged diesel	Muffler
Alternator, 70-amp	Engine enclosures, lockable	Precleaner
Armrest, electric adjustable (Finger Tip Control models only)	Extended life coolant	Seat, vinyl suspension, with adjustable armrests
Automatic shifting features (Finger Tip Control models)	Front pull device	Seat belt, 76 mm (3-inch)
Auto-kickdown (auto-downshift)	Fuel gauge	Segmented sprocket
Auto shift (2R-1F, 2R-2F)	Fuel priming pump	Single key start
Back up alarm	Gauge package, temperature:	Steering system:
Batteries (2), 12-volt each, 24-volt total	Coolant	Lever Steering or Finger Tip Control
Blower fan	Hydraulic oil (Finger Tip Control models)	Track:
Brake system, service, parking and emergency	Power train oil	Adjusters, hydraulic
Canopy, ROPS (regional)	Guards:	Carrier rollers
Computerized Caterpillar Monitoring System on Finger Tip Control models. Electronic monitoring system on Lever Steering models	Center section track guiding (LGP only)	Heavy Duty (HD) Sealed and Lubricated Track with single grouser, Moderate Service (MS) track shoes
Decelerator	Crankcase, normal service	XL — 41-section, 560 mm (22")
Diagnostic connector (Finger Tip Control models)	End track guiding	LGP — 44-section, 760 mm (30")
Drawbar, rigid	Instrument panel (OOPS)	Two-piece master link
Dual fuel filters	Radiator, hinged	Transmission, power shift
Ecology drains	Rear	Vandalism protection
	Horn	Water separator
	Hydraulics, three-valve for VPAT bulldozer	
	IMRM radiator	
	Lifetime Lubricated rollers and idlers	

Optional Equipment

Approximate changes in operating weights.

	kg	lb
Air conditioning system	130	287
Backup alarm	2	5
Bulldozers	(see page 17 for weights)	
Cab, ROPS, sound suppressed, with heater and fabric Cat Contour Series suspended and adjustable seat	571	1256
Fan, reversible	11	24
Guards:		
Crankcase, heavy duty	63	139
Fuel tank (for ROPS cab or canopy)	70	154
Precleaner	7	16
Radiator, heavy duty, hinged grill	20	44
Rear screen:		
for ROPS cab without air conditioner	67	148
for ROPS cab with air conditioner	51	112
for ROPS canopy	55	121
Track guiding, center section only (XL)	34	75
Track roller, full length	146	321
Heater, dash mounted (for ROPS canopy)	34	75
Hydraulic controls:		
four-valve for VPAT bulldozer and one rear implement	216	475
Lighting system, six lights:		
For use with ROPS cab	16	35
For use with ROPS canopy	16	35
Precleaner with prescreener	5	11
Ripper, radial with 3 curved teeth**	758	1671
Each tooth	34	74

	kg	lb
Seat, with adjustable armrest		
Air suspended Contour Series, cloth (for cab only)	41	89
Contour Series, vinyl, suspended (for cab, standard on canopy)	2	4
Low back, vinyl:	0	0
Sound suppression (for cab)	65	143
Starting aids		
Ether starting aid	3	7
Heater, engine coolant, choice of 120 or 240 volt (dealer installed)	1	2
Heavy duty batteries	42	94
Sweeps, for ROPS cab	140	309
Sweeps, for ROPS canopy	132	290
Tool kit (dealer installed)	7	16
Track, pair, Heavy Duty Sealed and Lubricated*		
XL arrangement, 41-section:		
510 mm (20") MS/HD	-170	-375
510 mm (20") ES/HD	80	176
560 mm (22") ES/HD	200	441
510 mm (20") MS/RBT	-116	-256
560 mm (22") MS/RBT	-20	-44
LGP arrangement, 44-section:		
610 mm (24") MS/HD	-220	-485
610 mm (24") MS/RBT	-250	-551
770 mm (30") MS/RBT	0	0
770 mm (30") self-cleaning/HD	348	767
Track rollers, high flange	15	33
Winch, standard or low-speed	1161	2560
Winch fairlead		
3 Roller	293	645
4 Roller	320	704

*ES = Extreme Service shoes, MS = Moderate Service shoes, HD = Heavy Duty track, RBT = Rotating Bushing Track

**Straight teeth available for ripper.

Model Comparisons

Former Model	kW	HP	Current Model
D4H	67	90	D5M 82 kW (110 hp)
D4H Series II Standard	71	95	
D4H Series III XL & LGP	78	105	
D5B	78	105	
D5H	89	120	
D5H Series II Standard	89	120	

Caterpillar Performance Handbook

Edition 31

CATERPILLAR[®]

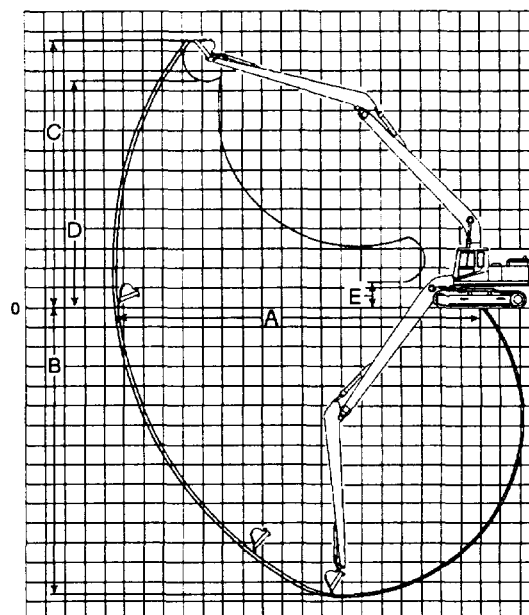
- Long Reach
- Introduction
 - Range Dimensions
 - Bucket Information

INTRODUCTION

Long reach excavators are designed purposely for light duty digging that requires reach capability well above that of normal digging machines. To be able to have high enough digging forces together with an acceptable size bucket, the long reach excavators have a smaller digging envelope than the ditch cleaning machines. Long reach excavators are ideally suited for deep digging in gravel or sand pits then feeding directly into a hopper.

Caterpillar's long reach hydraulic excavators use purpose-built booms and sticks designed by Caterpillar for maximum performance and durability in light duty applications.

Long Reach Excavation Fronts include: boom, stick, linkage cylinders (boom, stick, and bucket), hydraulic lines, additional counterweight for stability over the side and heavy duty wide undercarriage. Dimensions include light excavation bucket.



5

Long Reach Model	312B*		320B L		320C L	
	m	ft	m	ft	m	ft
A Maximum Reach at Ground Level	12.54	41'2"	15.72	51'7"	15.73	51'7"
B Maximum Digging Depth	9.80	32'2"	11.88	39'0"	11.88	39'0"
C Maximum Cutting Height	11.00	36'1"	13.29	43'7"	13.29	43'7"
D Maximum Dumping Height	9.01	29'7"	11.01	36'1"	11.01	36'1"
E Minimum Loading Height	2.15	7'1"	1.97	6'6"	1.97	6'6"

	322B L		325B L*		330B L*	
	m	ft	m	ft	m	ft
A Maximum Reach at Ground Level	18.43	60'6"	18.42	60'5"	20.94	68'8"
B Maximum Digging Depth	14.72	48'4"	14.75	48'5"	16.19	53'2"
C Maximum Cutting Height	14.23	46'8"	13.61	44'8"	16.52	54'2"
D Maximum Dumping Height	12.00	39'4"	11.42	37'6"	14.33	47'0"
E Minimum Loading Height	1.36	4'6"	1.16	3'10"	2.28	7'6"

Long Reach

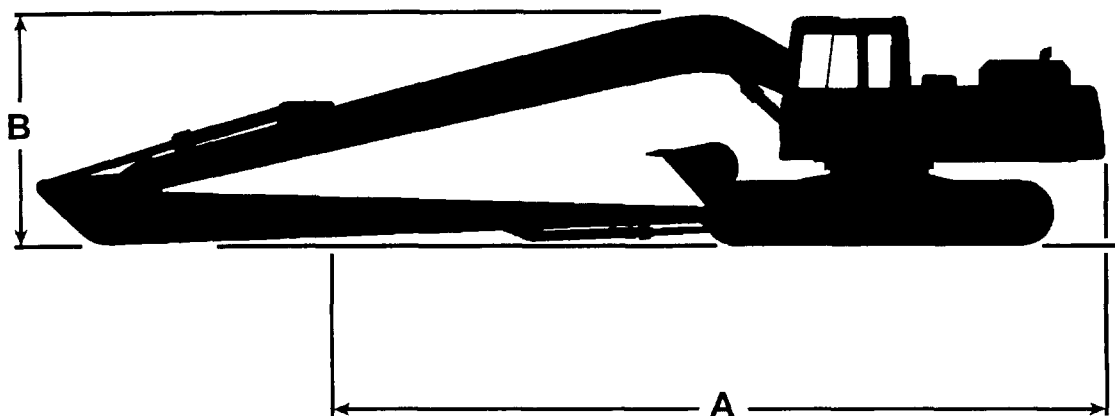
Model	Bucket Type	Bucket Width		SAE Heaped Cap.		Bucket Weight		No. of Teeth	Bucket Curl Force		Stick Crowd Force	
		mm	ft	L	yd ³	kg	lb		kN	lb	kN	lb
312B*	General Purpose	610	2'0"	230	0.30	200	440	4	44	9900	37	8300
320B L	Excavation	810	2'8"	450	0.59	340	750	5	54	12,100	47	10,600
320C L	Excavation	810	2'8"	450	0.59	340	750	5	54	12,100	47	10,600
322B L	Excavation	700	2'4"	380	0.50	335	740	4	54	12,100	50	11,200
322B L	Excavation	810	2'8"	450	0.59	340	750	5	54	12,100	50	11,200
325B L*	Excavation	810	2'8"	450	0.59	340	750	5	54	12,100	50	11,200
330B L*	Excavation	810	2'8"	450	0.59	340	750	5	61	13,700	43	9700

*Custom product.

Excavators

Long Reach

- Shipping Dimensions
- Major Component Weights



Long Reach, Dimensions	312B*		320B L		320C L	
	m	ft	m	ft	m	ft
A Overall Length (Front Folded)	10.22	33'6"	12.65	41'6"	12.66	41'6"
B Overall Height	2.80	9'2"	3.21	10'6"	3.21	10'6"
C Overall Width	2.69	8'10"	2.98	9'9"	3.01	9'11"

	322B L		325B L*		330B L*	
	m	ft	m	ft	m	ft
A Overall Length (Front Folded)	14.24	46'9"	14.38	47'2"	16.62	54'6"
B Overall Height	3.17	10'5"	3.25	10'8"	3.59	11'9"
C Overall Width	3.19	10'6"	3.19	10'6"	3.19	10'6"

Long Reach, Component Weights	312B*		320B L		320C L	
	kg	lb	kg	lb	kg	lb
Total Component Weight Includes additional over standard	2450	5400	4810	10,600	4810	10,600
Long Reach Boom	1140	2510	2185	4820	2185	4820
Long Reach Stick	640	1410	1260	2780	1260	2780

	322B L		325B L*		330B L*	
	kg	lb	kg	lb	kg	lb
Total Component Weight Includes additional over standard	5900	13,010	6500	14,330	7390	16,290
Long Reach Boom	3130	6900	3200	7055	4190	9240
Long Reach Stick	1570	3460	1570	3460	2130	4700

*Custom product.

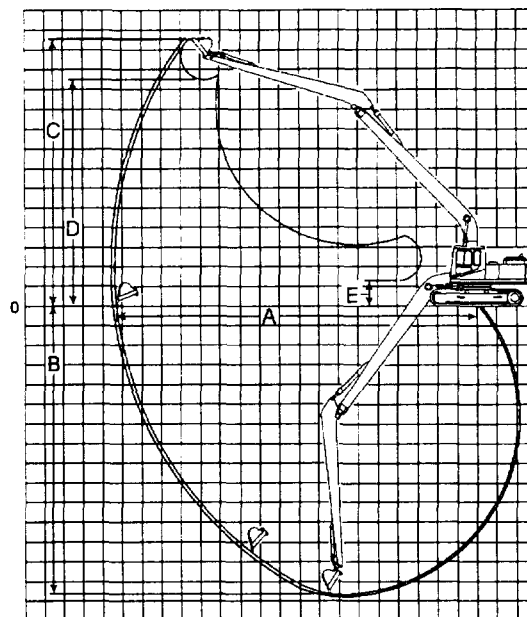
- Ditch Cleaning
- Introduction
 - Range Dimensions
 - Bucket Information

INTRODUCTION

Ditch cleaning excavators are designed specifically for those jobs requiring maximum reach well beyond the range of normal excavators. Those machines are designed to drag a small bucket at about 90 degrees over the side of the tracks towards the excavator; they are not suited for digging work. Caterpillar offers the Long Reach excavators for light digging applications with a much larger digging envelope than normal excavators. Ditch cleaning excavators are suited for ditch cleaning, slope finishing, river conservation and other work formerly reserved to draglines.

Caterpillar's ditch cleaning hydraulic excavators use purpose-built booms and sticks designed by Caterpillar for maximum performance and durability in dragging applications.

Ditch Cleaning Fronts include: boom, stick, linkage cylinders (boom, stick, and bucket), hydraulic lines and additional counterweight for stability while working over the side. Dimensions include ditch cleaning bucket.



5

Ditch Cleaning Model	312B*		315B L/317B L*		320B L		320C L	
	m	ft	m	ft	m	ft	m	ft
A Maximum Reach at Ground Level	12.54	41'2"	13.00	42'8"	15.59	51'2"	15.60	51'2"
B Maximum Digging Depth	9.80	32'2"	10.10	33'2"	11.75	38'7"	11.75	38'7"
C Maximum Cutting Height	10.96	35'11"	11.64	38'2"	13.23	43'5"	13.24	43'5"
D Maximum Dumping Height	9.01	29'9"	9.58	31'5"	11.14	36'6"	11.14	36'7"
E Minimum Loading Height	2.15	7'1"	2.55	8'4"	2.09	6'10"	2.10	6'10"

	322B L		325B L*		330B L*	
	m	ft	m	ft	m	ft
A Maximum Reach at Ground Level	18.30	60'0"	18.29	60'0"	20.81	68'3"
B Maximum Digging Depth	14.59	47'11"	14.63	48'0"	16.07	52'9"
C Maximum Cutting Height	14.19	46'7"	13.58	44'7"	16.49	54'1"
D Maximum Dumping Height	12.13	39'10"	11.55	37'11"	14.46	47'5"
E Minimum Loading Height	1.49	4'11"	1.29	4'3"	2.41	8'0"

Ditch Cleaning

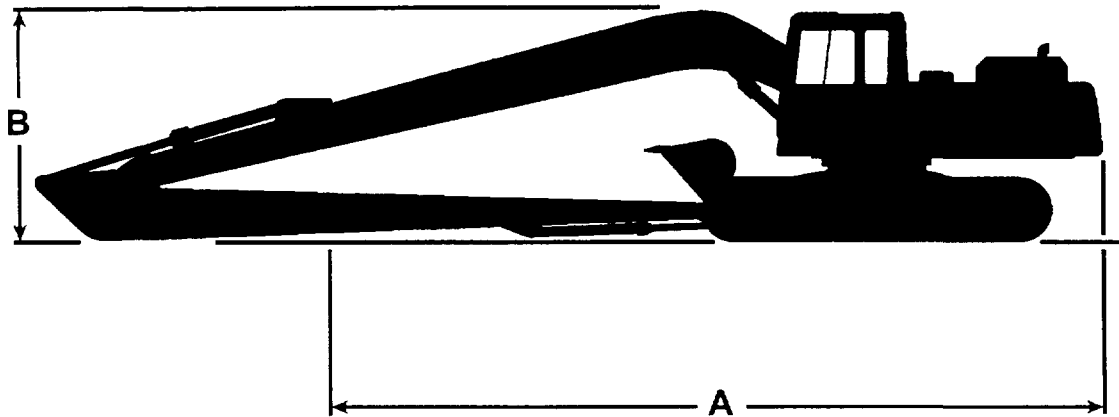
Model	Bucket Type	Bucket Width		SAE Heaped Cap.		Bucket Weight		No. of Teeth	Bucket Curl Force		Stick Crowd Force	
		mm	ft	L	yd ³	kg	lb		kN	lb	kN	lb
312B*	Ditch Cleaning	920	3'0"	480	0.63	230	510	0	44	9900	37	8300
320B L	Ditch Cleaning	1140	3'9"	600	0.78	290	640	0	60	13,500	46	10,300
320C L	Ditch Cleaning	1140	3'9"	600	0.78	290	640	0	60	13,500	46	10,300
322B L	Ditch Cleaning	1140	3'9"	600	0.78	290	640	0	61	13,700	51	11,500
325B L*	Ditch Cleaning	1140	3'9"	600	0.78	290	640	0	61	13,700	51	11,500
330B L*	Ditch Cleaning	1140	3'9"	600	0.78	290	640	0	61	13,700	43	9700

*Custom product.

Excavators

Ditch Cleaning

- Shipping Dimensions
- Major Component Weights



Ditch Cleaning, Dimensions	312B*		315B L/317B L*		320B L		320C L	
	m	ft	m	ft	m	ft	m	ft
A Overall Length (Front Folded)	10.22	33'6"	11.23	36'10"	12.65	41'6"	12.66	41'6"
B Overall Height	2.80	9'2"	2.92	9'7"	3.21	10'6"	3.21	10'6"
C Overall Width	2.76	9'1"	2.75	9'0"	2.98	9'9"	3.01	9'11"

	322B L		325B L*		330B L*	
	m	ft	m	ft	m	ft
A Overall Length (Front Folded)	14.24	46'9"	14.38	47'2"	16.62	54'6"
B Overall Height	3.17	10'5"	3.25	10'8"	3.59	11'9"
C Overall Width	3.19	10'6"	3.19	10'6"	3.19	10'6"

Ditch Cleaning, Component Weights	312B*		315B L/317B L		320B L		320C L	
	kg	lb	kg	lb	kg	lb	kg	lb
Total Component Weight Includes additional over standard	3100	6830	3050	6725	4810	10,600	4840	10,670
Long Reach Boom	1140	2510	1210	2670	2185	4820	2185	4820
Long Reach Stick	640	1410	780	1720	1260	2780	1260	2780

	322B L		325B L*		330B L*	
	kg	lb	kg	lb	kg	lb
Total Component Weight Includes additional over standard	5900	13,000	6500	14,330	7390	16,290
Long Reach Boom	3130	6900	3200	7055	4190	9240
Long Reach Stick	1570	3460	1570	3460	2130	4700

*Custom product.

725

Articulated Trucks

CAT®



Engine

Engine Model	3176C ATAAC EUI	
Gross Power	223.7 kW	300 hp
Flywheel Power	209 kW	280 hp

Weights

Rated Payload	22.7 t	25 Sh Ton
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Body Capacities

Heaped SAE 2:1	13.7 m ³	18 yd ³
----------------	---------------------	--------------------

Engine

Engine Model	3176C ATAAC EUI	
Gross Power	223.7 kW	300 hp
Flywheel Power	209 kW	280 hp
ISO 9249	209 kW	280 hp
EEC 80/1269	209 kW	280 hp
SAE J1349	207 kW	277 hp
Bore	125 mm	4.9 in
Stroke	140 mm	5.5 in
Displacement	10.3 L	629 in ³

- The 725 meets TierII/Stage 2 emission specifications for the U.S. and Europe through 2005.
- No engine derating required below 4572 m (15,000 ft.).

Weights

Rated Payload	22.7 t	25 Sh Ton
---------------	--------	-----------

Body Capacities

Heaped SAE 2:1	13.7 m ³	18 yd ³
Struck	10.4 m ³	13.6 yd ³
Heaped SAE 1:1	22 m ³	16.8 yd ³

Transmission

Forward 1	7.1 kph	4.44 mph
Forward 2	13.39 kph	8.37 mph
Forward 3	20.37 kph	12.73 mph
Forward 4	31.23 kph	19.52 mph
Forward 5	43.47 kph	27.17 mph
Forward 6	51.34 kph	32.09 mph
Reverse 1	7.87 kph	4.92 mph

Sound Performance

The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ANSI/SAE J1166 OCT 98 is 76 dB(A), for the cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.

Hearing protection may be needed when operating with an open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.

Operating Weights

Front Axle - Empty	12 250 kg	27,011 lb
Center Axle - Empty	4630 kg	10,209 lb
Rear Axle - Empty	4840 kg	10,672 lb
Total - Empty	21 720 kg	47,892 lb
Front Axle - Rated Load	1840 kg	4,057 lb
Center Axle - Rated Load	10 420 kg	22,976 lb
Rear Axle - Rated Load	10 420 kg	22,976 lb
Total - Rated Load	22 680 kg	50,009 lb
Front Axle - Loaded	14 090 kg	31,068 lb
Center Axle - Loaded	15 050 kg	33,185 lb
Rear Axle - Loaded	15 260 kg	33,648 lb
Total - Loaded	44 400 kg	97,902 lb

Body Plate Thickness

Front	8 mm	0.31 in
Scow	14 mm	0.55 in
Side	12 mm	0.47 in
Base	14 mm	0.55 in

Service Refill Capacities

Fuel Tank	310 L	82 Gal
Cooling System	85 L	22.5 Gal
Hydraulic System	150 L	39.3 Gal
Engine Crankcase	31 L	8.2 Gal
Transmission	36 L	9.4 Gal
Final Drives/Differential	132 L	34.6 Gal
Output Transfer Gear	20 L	5.2 Gal

Sound Levels

Interior Cab	76 dB(A)
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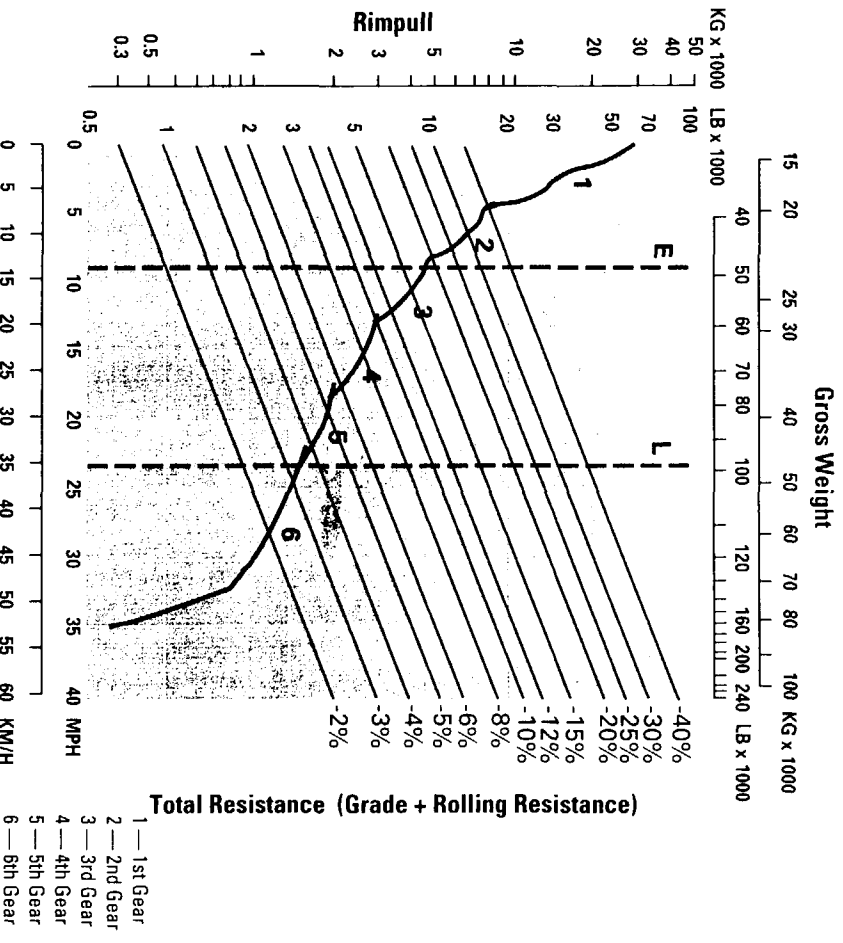
Standards

Meets the following standards:

Brakes	SAE J/ISO 3450-1998
Cab/FOPS	SAE J231 JAN81 and ISO 3449-1992 Level II
Cab/ROPS	SAE J1040 May 1994 and ISO 3471-1994

Gradeability/Speed/Rimpull

To determine performance, read from Gross Weight down to % Total Resistance. Total Resistance equals actual % grade plus 1% for each 10 kg/metric ton (20 lb/ton) of Rolling Resistance. From this point, read horizontally to the curve with the highest attainable speed range. Then, go down to Maximum Speed. Usable Rimpull depends on traction available.



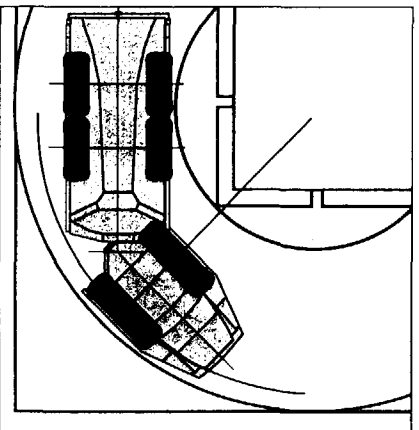
Speed
E — Empty 21 720 kg (47 880 lb)
L — Loaded 44 400 kg (97 880 lb)

Turning Circle

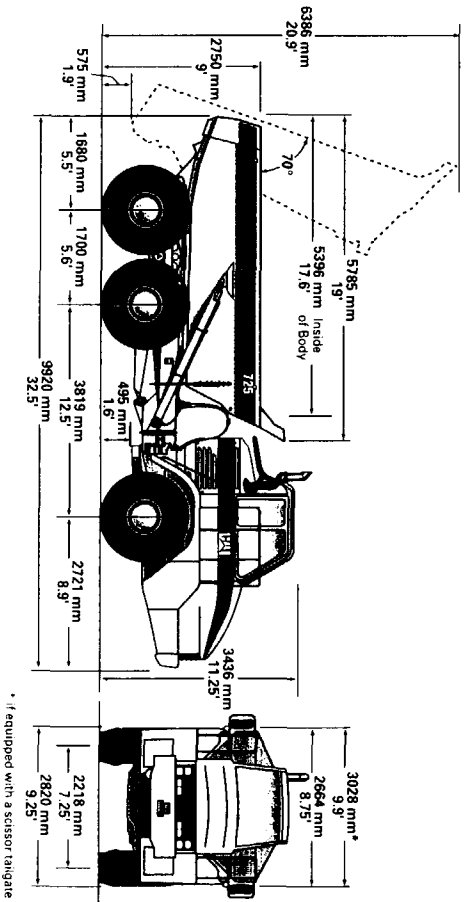
Dimensions are for machines equipped with 23.5R25 tires.

Turning dimensions

	mm	in
Steer angle — left/right	45	1.77
SAE turning radius	7225	284
Clearing radius	7590	299
Inside radius	3745	147
Aisle width	4942	194



Dimensions



315C 315C L

Hydraulic
Excavators



Weights

Operating Weight* 16 710 kg 36,840 lb

*long undercarriage, 3100 mm (10' 2") stick and 600 mm (24") shoes

Engine

Engine Model Cat® 3046 T

Gross Power 86 kW 115 hp

Flywheel Power 82 kW 110 hp

Swing Mechanism

Swing Torque 42 980 N.m 31,700 lb ft

Engine

Engine Model	Cat 3046 T	
Gross Power	86 kW	115 hp
Flywheel Power	82 kW	110 hp
ISO 9249	82 kW	110 hp
SAE J1349	82 kW	110 hp
EEC 80/1269	82 kW	110 hp
Bore	94 mm	3.7 in
Stroke	120 mm	4.7 in
Displacement	4.99 L	305 in ³

- The 315C meets worldwide emission requirements.
- Net power advertised is the power available at the flywheel when the engine is equipped with fan, air cleaner, muffler, and alternator.
- No engine derating required below 2300 m (7,500 ft) altitude.

Weights

Operating Weight	16 710 kg	36,840 lb
------------------	-----------	-----------

Swing Mechanism

Swing Torque	42 980 N.m	31,700 lb ft
Swing Speed	10.2 RPM	

Drive

Travel Speed	5.6 kph	3.4 mph
Max. Drawbar Pull	154 kN	33,710 lb

Hydraulic System

Main Implement System - Max.		
Flow (2x)	150 L/min	39.6 gal/min
Max. Pressure - Implements	34 300 kPa	4,980 psi
Max. Pressure - Travel	34 300 kPa	4,980 psi
Max Pressure - Swing	22 550 kPa	3,270 psi
Pilot System - Max. Flow	23.7 L/min	6.3 gal/min
Pilot System - Max. Pressure	4120 kPa	600 psi
Boom Cylinder - Bore	110 mm	4.3 in
Boom Cylinder - Stroke	1193 mm	47 in
Stick Cylinder - Bore	120 mm	4.7 in
Stick Cylinder - Stroke	1331 mm	52.4 in
Bucket Cylinder - Bore	100 mm	3.9 in
Bucket Cylinder - Stroke	1048 mm	41 in

Service Refill Capacities

Fuel Tank	285 L	75 gal
Cooling System	22 L	5.8 gal
Engine Oil	19 L	5 gal
Swing Drive	3 L	0.8 gal
Final Drive (Each)	4 L	1.06 gal
Hydraulic System (Including Tank)	190 L	50.2 gal
Hydraulic Tank	106 L	28 gal

Standards

Meets the following standards:

Cab/FOGS	SAE J1356 FEB88 ISO 10262
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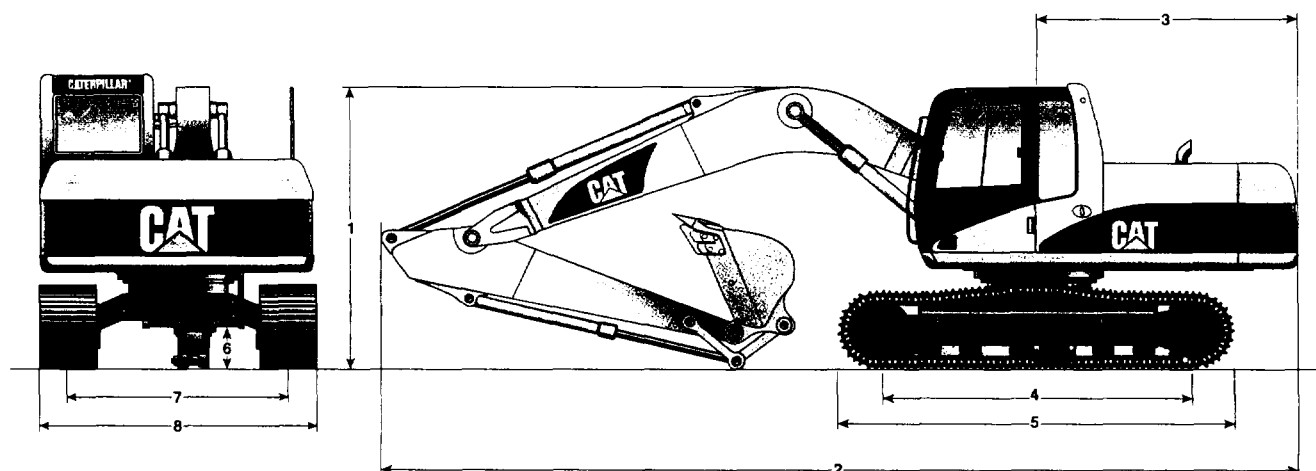
Sound Performance

The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ANSI/SAE J1166 OCT98 is 74 dB(A), for the cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.

Hearing protection may be needed when operating with an open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.

Dimensions

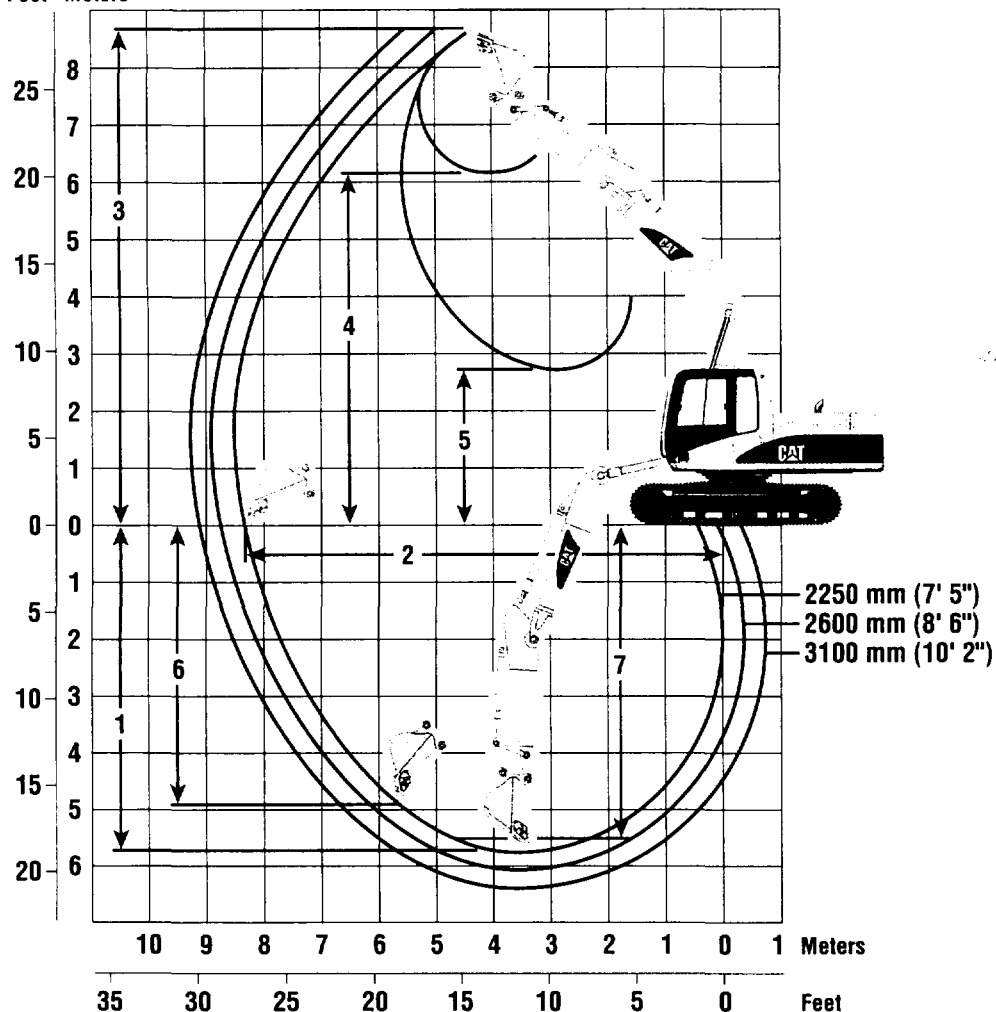
All dimensions are approximate.



	2250 mm (7'5") Stick	2600 mm (8'6") Stick	3100 mm (10'2") Stick
1 Shipping height	2880 mm (9'5")	2880 mm (9'5")	2990 mm (9'10")
2 Shipping length	8470 mm (27'10")	8500 mm (27'11")	8520 mm (28'0")
3 Tail swing radius	2450 mm (8'0")	2450 mm (8'0")	2450 mm (8'0")
4 Length to centers of rollers			
315C	2880 mm (9'5")	2880 mm (9'5")	2880 mm (9'5")
315C L	3170 mm (10'5")	3170 mm (10'5")	3170 mm (10'5")
5 Track length			
315C	3690 mm (12'1")	3690 mm (12'1")	3690 mm (12'1")
315C L	3970 mm (13'0")	3970 mm (13'0")	3970 mm (13'0")
6 Ground clearance	460 mm (18")	460 mm (18")	460 mm (18")
7 Track gauge	1990 mm (6'6")	1990 mm (6'6")	1990 mm (6'6")
8 Transport width	with 500 mm (20") 2490 mm (8'2")	with 600 mm (24") 2590 mm (8'6")	with 700 mm (28") 2690 mm (8'10")

Working Ranges

Feet Meters



Stick Length	2250 mm (7'5") Stick	2600 mm (8'6") Stick	3100 mm (10'2") Stick
1 Maximum Digging Depth	5705 mm (18'9")	6055 mm (19'10")	6555 mm (21'6")
2 Maximum Reach at Ground Level	8420 mm (27'7")	8740 mm (28'8")	9140 mm (30'0")
3 Maximum Cutting Height	8735 mm (28'8")	8910 mm (29'3")	8970 mm (29'5")
4 Maximum Loading Height	6150 mm (20'2")	6320 mm (20'9")	6410 mm (21'0")
5 Minimum Loading Height	2690 mm (8'10")	2340 mm (7'8")	1840 mm (6'0")
6 Maximum Depth Cut for 2440 mm (8') Level Bottom	5455 mm (17'11")	5825 mm (19'1")	6330 mm (20'9")
7 Maximum Vertical Wall Digging Depth	4930 mm (16'2")	5335 mm (17'6")	5570 mm (18'3")
Stick Digging Force (SAE)	84 kN (18,880 lb)	76 kN (17,080 lb)	68 kN (15,280 lb)
Bucket Digging Force (SAE)	99 kN (22,250 lb)	99 kN (22,250 lb)	99 kN (22,250 lb)

Buckets

Buckets have tapered sides, angled corner teeth, dual radius curvature, horizontal wear strips, and holes for optional side cutters.

Excavation Bucket

Width		Capacity		Number of Teeth	Weight with Teeth		Tip Radius	
mm	in	m ³	yd ³		kg	lb	mm	in
610	24	0.33	0.43	3	423	933	1340	53
760	30	0.46	0.60	4	480	1058	1340	53
910	36	0.59	0.78	5	538	1186	1340	53
1070	42	0.73	0.95	6	583	1285	1340	53
1220	48	0.86	1.13	6	641	1413	1340	53

Width		Capacity		Short Stick		Medium Stick		Long Stick	
mm	in	m ³	yd ³	kg/m ³	lb/yd ³	kg/m ³	lb/yd ³	kg/m ³	lb/yd ³
610	24	0.33	0.43	1800	3000	1800	3000	1800	3000
760	30	0.46	0.60	1800	3000	1800	3000	1800	3000
910	36	0.59	0.78	1800	3000	1800	3000	1800	3000
1070	42	0.73	0.95	1800	3000	1700	2850	1400	2350
1220	48	0.86	1.13	1500	2500	1300	2150	1100	1850

Heavy Duty Rock Bucket

Width		Capacity		Number of Teeth	Weight with Teeth		Tip Radius	
mm	in	m ³	yd ³		kg	lb	mm	in
620	24	0.33	0.43	3	490	1080	1340	53
770	30	0.46	0.60	4	562	1239	1340	53
930	36	0.59	0.78	5	636	1402	1340	53
1080	42	0.73	0.95	6	693	1528	1340	53
1230	48	0.86	1.13	6	766	1689	1340	53

Width		Capacity		Short Stick		Medium Stick		Long Stick	
mm	in	m ³	yd ³	kg/m ³	lb/yd ³	kg/m ³	lb/yd ³	kg/m ³	lb/yd ³
620	24	0.33	0.43	1800	3000	1800	3000	1800	3000
770	30	0.46	0.60	1800	3000	1800	3000	1800	3000
930	36	0.59	0.78	1800	3000	1800	3000	1700	2850
1080	42	0.73	0.95	1700	2850	1500	2500	1200	2000
1230	48	0.86	1.13	1400	2350	1200	2000	1000	1650

Material Densities

Material	kg/m ³	lb/yd ³	Material	kg/m ³	lb/yd ³
Clay, dry	1480	2500	Gravel, pit run	1930	3250
Clay, wet	1660	2800	Rock/dirt, 50%	1720	2900
Earth, dry	1510	2550	Sand, dry	1420	2400
Earth, wet	1600	2700	Sand, wet	1840	3100
Loam	1250	2100	Sand & Clay	1600	2700
Gravel, dry	1510	2550	Stone, crushed	1600	2700
Gravel, wet	2020	3400	Top soil	950	1600

For densities of other materials see Caterpillar Performance Handbook

Operating Weights

Caterpillar designed and built track-type undercarriage.

Track Width		Operating Weight (Short Stick)	Operating Weight (Medium Stick)	Operating Weight (Long Stick)
315C	500 mm (20") triple grouser	16 100 kg (35,500 lb)	16 090 kg (35,470 lb)	16 170 kg (35,650 lb)
	600 mm (24") triple grouser	16 320 kg (35,980 lb)	16 310 kg (35,960 lb)	16 400 kg (36,160 lb)
	700 mm (28") triple grouser	16 520 kg (36,420 lb)	16 510 kg (36,400 lb)	16 600 kg (36,600 lb)
315C L	500 mm (20") triple grouser	16 430 kg (36,220 lb)	16 470 kg (36,310 lb)	16 510 kg (36,400 lb)
	600 mm (24") triple grouser	16 680 kg (36,770 lb)	16 710 kg (36,840 lb)	16 750 kg (36,930 lb)
	700 mm (28") triple grouser	16 890 kg (37,240 lb)	16 920 kg (37,300 lb)	16 970 kg (37,410 lb)

Undercarriage

Caterpillar designed and built track-type undercarriage.

Track Width	Ground Pressure	
	315C	315C L
500 mm (20") triple grouser	50 kPa (7.25 psi)	47 kPa (6.82 psi)
600 mm (24") triple grouser	42 kPa (6.10 psi)	39 kPa (5.66 psi)
700 mm (28") triple grouser	36 kPa (5.22 psi)	34 kPa (4.93 psi)

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front















Load Radius
Over Side

R2.25 STICK – 2250 mm (7'5")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Standard
SHOES – 500 mm (20") triple grouser

BOOM – 5100 mm (16'9")















		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)				m ft
												
7.5 m 25.0 ft	kg lb									*1950 *4350	*1950 *4350	5.81 18.57
6.0 m 20.0 ft	kg lb							*2600 *5650	*2600 *5650	*1800 *3900	*1800 *3900	7.16 23.27
4.5 m 15.0 ft	kg lb					*4250 *9200	*4250 *9200	*3900 8450	2700 5800	*1750 *3800	1650 3650	7.90 25.83
3.0 m 10.0 ft	kg lb			*8650 *18,300	7950 17,150	*5500 *11,850	4200 9000	3850 8200	2600 5550	*1800 *3950	1450 3200	8.23 26.99
1.5 m 5.0 ft	kg lb					5850 12,500	3850 8250	3700 7900	2450 5250	*1950 *4300	1400 3100	8.22 26.98
Ground Line	kg lb			*5450 *12,550	*5450 *12,550	5600 12,000	3650 7800	3550 7600	2350 5000	*2250 *4900	1500 3300	7.87 25.81
-1.5 m -5.0 ft	kg lb	*5250 *11,750	*5250 *11,750	*9500 *21,750	6800 14,600	5500 11,850	3550 7650	3500 7550	2300 4900	2750 6000	1800 3950	7.12 23.30
-3.0 m -10.0 ft	kg lb	*9600 *21,550	*9600 *21,550	*10,050 *21,700	7000 15,000	5600 12,000	3650 7800			*3150 *6800	2550 5750	5.79 18.80
-4.5 m -15.0 ft	kg lb			*7000 *15,400	*7000 *15,400					*5000 *11,300	4500 10,750	4.08 12.70

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

R2.6 STICK – 2600 mm (8'6")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Standard
SHOES – 500 mm (20") triple grouser

BOOM – 5100 mm (16'9")

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
													
7.5 m 25.0 ft	kg lb										*1700 *3750	*1700 *3750	6.28 20.16
6.0 m 20.0 ft	kg lb						*3100 *6250	2900 6200			*1550 *3400	*1550 *3400	7.53 24.49
4.5 m 15.0 ft	kg lb						*3650 *7950	2800 5950			*1500 *3300	*1500 *3300	8.23 26.91
3.0 m 10.0 ft	kg lb		*7700 *16,350	*7700 *16,350	*5150 *11,100	4300 9200	3900 8350	2650 5700	2650 *5550	1750 3750	*1600 *3450	1400 3050	8.55 28.03
1.5 m 5.0 ft	kg lb		*5600 *13,500	*5600 *13,500	5900 12,700	3900 8400	3750 8000	2500 5350	2550 5500	1700 3600	*1700 *3750	1350 2950	8.54 28.02
Ground Line	kg lb		*5950 *13,700	*5950 *13,700	5650 12,100	3650 7850	3600 7700	2400 5100	2500 5500	1650 3600	*1950 *4300	1400 3100	8.20 26.91
-1.5 m -5.0 ft	kg lb	*4900 *11,000	*4900 *11,000	*9050 *20,600	6800 14,500	5500 11,850	3550 7650	3500 7550	2300 4950		*2400 *5300	1650 3600	7.49 24.53
-3.0 m -10.0 ft	kg lb	*8500 *19,050	*8500 *19,050	*10,600 *22,850	6900 14,800	5550 11,900	3600 7750	3550 7650	2350 5050		*3350 *7450	2250 5050	6.26 20.37
-4.5 m -15.0 ft	kg lb			*8050 *17,050	7250 15,550	*5200 *11,500	3800 8350				*4950 *10,850	3650 8250	4.65 14.92

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front

















Load Radius
Over Side

R3.1 STICK – 3100 mm (10'2")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Standard
SHOES – 500 mm (20") triple grouser

BOOM – 5100 mm (16'9")













		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1400 *3150	*1400 *3150	6.85 22.07
6.0 m 20.0 ft	kg lb							*2850 *6250	*2850 *6250			*1300 *2900	*1300 *2900	7.98 26.01
4.5 m 15.0 ft	kg lb							*3250 *7050	2850 6050	*2350 *4500	1850 3900	*1300 *2850	*1300 *2850	8.64 28.27
3.0 m 10.0 ft	kg lb			*6350 *13,950	*6350 *13,950	*4550 *9850	4350 9400	*3850 *8300	2700 5750	2650 5650	1750 3750	*1350 *3000	1250 2750	8.94 29.32
1.5 m 5.0 ft	kg lb			*9700 *21,250	7400 15,950	5950 12,800	3950 8500	3750 8000	2500 5350	2550 5450	1700 3550	*1500 *3250	1200 2650	8.93 29.32
Ground Line	kg lb			*6950 *15,900	6800 14,650	5650 12,100	3650 7850	3550 7650	2350 5000	2500 5300	1600 3400	*1750 *3800	1250 2750	8.62 28.27
-1.5 m -5.0 ft	kg lb	*4700 *10,450	*4700 *10,450	*8850 *20,100	6700 14,300	5450 11,700	3500 7550	3450 7450	2250 4850	2450 5350	1550 3450	*2150 *4700	1450 3150	7.95 26.04
-3.0 m -10.0 ft	kg lb	*7500 *16,850	*7500 *16,850	*11,100 *23,950	6750 14,450	5450 11,700	3500 7500	3450 7450	2250 4800			2900 6450	1900 4200	6.82 22.23
-4.5 m -15.0 ft	kg lb	*11,400 *25,800	*11,400 *25,800	*9100 *19,450	7000 15,050	5600 12,050	3650 7800					*2850 *6900	*2850 *6900	4.92 15.81

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

R2.25 STICK – 2250 mm (7'5")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Long
SHOES – 600 mm (24") triple grouser

BOOM – 5100 mm (16'9")

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)				m ft
											
7.5 m 25.0 ft	kg lb								*1950 *4350	*1950 *4350	5.81 18.57
6.0 m 20.0 ft	kg lb						*2600 *5650	*2600 *5650	*1800 *3900	*1800 *3900	7.16 23.27
4.5 m 15.0 ft	kg lb				*4250 *9200	*4250 *9200	*3900 *8500	2800 6000	*1750 *3800	1700 3800	7.90 25.83
3.0 m 10.0 ft	kg lb		*8650 *18,300	8200 17,700	*5500 *11,850	4350 9300	*4400 *9550	2700 5750	*1800 *3950	1550 3350	8.23 26.99
1.5 m 5.0 ft	kg lb				*6800 *14,600	4000 8550	4350 9300	2550 5450	*1950 *4300	1500 3250	8.22 26.98
Ground Line	kg lb		*5450 *12,550	*5450 *12,550	6700 14,350	3750 8100	4200 9050	2450 5200	*2250 *4900	1550 3450	7.87 25.81
-1.5 m -5.0 ft	kg lb	*5250 *11,750	*5250 *11,750	*9500 *21,750	7050 15,100	6600 14,150	3700 7950	4150 8950	*2750 *6100	1850 4100	7.12 23.30
-3.0 m -10.0 ft	kg lb	*9600 *21,550	*9600 *21,550	*10,050 *21,700	7250 15,500	6700 14,350	3750 8100		*3150 *6800	2650 5950	5.79 18.80
-4.5 m -15.0 ft	kg lb			*7000 *15,400	*7000 *15,400				*5000 *11,300	4650 11,150	4.08 12.70

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front

















Load Radius
Over Side

R2.6 STICK – 2600 mm (8'6")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Long
SHOES – 600 mm (24") triple grouser

BOOM – 5100 mm (16'9")















		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1650 *3650	*1650 *3650	6.28 20.16
6.0 m 20.0 ft	kg lb							*2900 *5900	*2900 *5900			*1500 *3300	*1500 *3300	7.53 24.49
4.5 m 15.0 ft	kg lb							*3600 *7850	2850 6100			*1500 *3250	*1500 *3250	8.23 26.91
3.0 m 10.0 ft	kg lb			*7650 *16,300	*7650 *16,300	*5150 *11,050	4400 9450	*4150 *9050	2700 5800	*2900 *5450	1800 3800	*1550 *3350	1400 3100	8.55 28.03
1.5 m 5.0 ft	kg lb			*5550 *13,350	*5550 *13,350	*6500 *14,000	4050 8650	4350 9350	2550 5500	3000 6400	1750 3650	*1700 *3650	1400 3000	8.54 28.02
Ground Line	kg lb			*5850 *13,500	*5850 *13,500	6700 14,400	3800 8100	4200 9050	2450 5200	2950 6450	1700 3650	*1900 *4200	1450 3150	8.20 26.91
-1.5 m -5.0 ft	kg lb	*4850 *10,850	*4850 *10,850	*8950 *20,400	7000 *15,050	6600 14,150	3700 7900	4150 8900	2400 5100			*2350 *5200	1700 3700	7.49 24.53
-3.0 m -10.0 ft	kg lb	*8400 *18,900	*8400 *18,900	*10,550 *22,800	7150 15,350	6650 14,200	3700 7950	4200 9000	2400 5150			*3300 *7350	2300 5150	6.26 20.37
-4.5 m -15.0 ft	kg lb			*8000 *17,000	7450 16,050	*5200 *11,400	3900 8600					*4900 *10,800	3750 8500	4.65 14.92

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

R3.1 STICK – 3100 mm (10'2")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Long
SHOES – 600 mm (24") triple grouser

BOOM – 5100 mm (16'9")

		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1400 *3150	*1400 *3150	6.85 22.07
6.0 m 20.0 ft	kg lb							*2850 *6250	*2850 *6250			*1300 *2900	*1300 *2900	7.98 26.01
4.5 m 15.0 ft	kg lb							*3250 *7050	2950 6250	*2350 *4500	1900 4050	*1300 *2850	*1300 *2850	8.64 28.27
3.0 m 10.0 ft	kg lb			*6350 *13,950	*6350 *13,950	*4550 *9850	4500 9700	*3850 *8300	2800 5950	3100 *6500	1850 3900	*1350 *3000	1300 2850	8.94 29.32
1.5 m 5.0 ft	kg lb			*9700 *21,250	7650 16,500	*6000 *12,950	4100 8800	4400 9450	2600 5550	3050 6450	1750 3750	*1500 *3250	1250 2750	8.93 29.32
Ground Line	kg lb			*6950 *15,900	*6950 15,150	6750 14,450	3800 8150	4250 9050	2450 5250	2950 6300	1700 3600	*1750 *3800	1300 2900	8.62 28.27
-1.5 m -5.0 ft	kg lb	*4700 *10,450	*4700 *10,450	*8850 *20,100	6950 14,850	6550 14,050	3650 7850	4150 8850	2350 5050	2900 6400	1650 3600	*2150 *4700	1500 3300	7.95 26.04
-3.0 m -10.0 ft	kg lb	*7500 *16,850	*7500 *16,850	*11 100 *23,950	7000 15,000	6550 14,050	3650 7800	4100 8850	2350 5050			*2950 *6600	2000 4400	6.82 22.23
-4.5 m -15.0 ft	kg lb	*11 400 *25,800	*11 400 *25,800	*9100 *19,450	7250 15,550	*6050 *12,850	3750 8100					*2850 *6900	*2850 *6900	4.92 15.81

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front















Load Radius
Over Side

R2.25 STICK – 2250 mm (7'5")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Standard
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")















		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)				m ft
												
7.5 m 25.0 ft	kg lb									*1950 *4350	*1950 *4350	5.81 18.57
6.0 m 20.0 ft	kg lb							*2600 *5650	*2600 *5650	*1800 *3900	*1800 *3900	7.16 23.27
4.5 m 15.0 ft	kg lb					*4250 *9200	*4250 *9200	*3900 *8500	2800 5950	*1750 *3800	1700 3750	7.90 25.83
3.0 m 10.0 ft	kg lb			*8650 *18,300	8150 17,550	*5500 *11,850	4300 9200	3950 8450	2650 5700	*1800 *3950	1500 3300	8.23 26.99
1.5 m 5.0 ft	kg lb					6000 12,850	3950 8500	3800 8100	2550 5400	*1950 *4300	1450 3200	8.22 26.98
Ground Line	kg lb			*5450 *12,550	*5450 *12,550	5750 12,300	3750 8000	3650 7850	2400 5150	*2250 *4900	1550 3400	7.87 25.81
-1.5 m -5.0 ft	kg lb	*5250 *11,750	*5250 *11,750	*9500 *21,750	7000 15,000	5650 12,150	3650 7850	3600 7750	2350 5050	*2750 *6100	1850 4050	7.12 23.30
-3.0 m -10.0 ft	kg lb	*9600 *21,550	*9600 *21,550	*10,050 *21,700	7150 15,350	5750 12,300	3750 8000			*3150 *6800	2650 5900	5.79 18.80
-4.5 m -15.0 ft	kg lb			*7000 *15,400	*7000 *15,400					*5000 *11,300	4600 11,050	4.08 12.70

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

R2.6 STICK – 2600 mm (8'6")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Standard
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")

		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1700 *3750	*1700 *3750	6.28 20.16
6.0 m 20.0 ft	kg lb							*3100 *6250	3000 *6250			*1550 *3400	*1550 *3400	7.53 24.49
4.5 m 15.0 ft	kg lb							*3650 *7950	2850 6100			*1500 *3300	*1500 *3300	8.23 26.91
3.0 m 10.0 ft	kg lb			*7700 *16,350	*7700 *16,350	*5150 *11,100	4400 9450	4000 8600	2750 5850	2700 *5550	1800 3850	*1600 *3450	1450 3150	8.55 28.03
1.5 m 5.0 ft	kg lb			*5600 *13,500	*5600 *13,500	6050 13,000	4000 8650	3850 8200	2600 5500	2650 5650	1750 3700	*1700 *3750	1400 3050	8.54 28.02
Ground Line	kg lb			*5950 *13,700	*5950 *13,700	5800 12,400	3750 8100	3700 7900	2450 5250	2600 5700	1700 3700	*1950 *4300	1450 3200	8.20 26.91
-1.5 m -5.0 ft	kg lb	*4900 *11,000	*4900 *11,000	*9050 *20,600	6950 14,900	5650 12,150	3650 7850	3600 7750	2400 5100			*2400 *5300	1700 3750	7.49 24.53
-3.0 m -10.0 ft	kg lb	*8500 *19,050	*8500 *19,050	*10,600 *22,850	7100 15,200	5700 12,250	3700 7950	3650 7850	2400 5200			*3350 *7450	2350 5150	6.26 20.37
-4.5 m -15.0 ft	kg lb			*8050 *17,050	7400 15,900	*5200 *11,500	3900 8550					*4950 *10,850	3700 8500	4.65 14.92

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front

















Load Radius
Over Side

R3.1 STICK – 3100 mm (10'2")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Standard
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")













	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft	
														
7.5 m 25.0 ft	kg lb											*1400 *3150	*1400 *3150	6.85 22.07
6.0 m 20.0 ft	kg lb							*2850 *6250	*2850 *6250			*1300 *2900	*1300 *2900	7.98 26.01
4.5 m 15.0 ft	kg lb							*3250 *7050	2900 6200	*2350 *4500	1900 4000	*1300 *2850	*1300 *2850	8.64 28.27
3.0 m 10.0 ft	kg lb			*6350 *13,950	*6350 *13,950	*4550 *9850	4450 9600	*3850 *8300	2750 5900	2700 5800	1800 3850	*1350 *3000	1300 2850	8.94 29.32
1.5 m 5.0 ft	kg lb			*9700 *21,250	7600 16,350	*6000 *12,950	4050 8750	3850 8200	2600 5500	2650 5600	1750 3700	*1500 *3250	1250 2700	8.93 29.32
Ground Line	kg lb			*6950 *15,900	*6950 15,000	5800 12,400	3750 8050	3650 7850	2400 5150	2550 5450	1650 3550	*1750 *3800	1300 2850	8.62 28.27
-1.5 m -5.0 ft	kg lb	*4700 *10,450	*4700 *10,450	*8850 *20,100	6850 14,700	5600 12,050	3600 7750	3550 7650	2350 5000	2500 5500	1650 3550	*2150 *4700	1500 3250	7.95 26.04
-3.0 m -10.0 ft	kg lb	*7500 *16,850	*7500 *16,850	*11 100 *23,950	6950 14,850	5600 12,000	3600 7750	3550 7650	2300 4950			*2950 *6600	1950 4350	6.82 22.23
-4.5 m -15.0 ft	kg lb	*11 400 *25,800	*11 400 *25,800	*9100 *19,450	7200 15,400	5750 12,350	3750 8050					*2850 *6900	*2850 *6900	4.92 15.81

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

R2.25 STICK – 2250 mm (7'5")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Long
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")

	1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)				m ft
											
7.5 m 25.0 ft	kg lb									*1950 *4350	5.81 18.57
6.0 m 20.0 ft	kg lb						*2600 *5650	*2600 *5650	*1800 *3900	*1800 *3900	7.16 23.27
4.5 m 15.0 ft	kg lb				*4250 *9200	*4250 *9200	*3900 *8500	2850 6100	*1750 *3800	*1750 *3800	7.90 25.83
3.0 m 10.0 ft	kg lb			*8650 *18,300	8300 17,900	*5500 *11,850	4400 9400	*4400 *9550	2750 5850	*1800 *3950	8.23 26.99
1.5 m 5.0 ft	kg lb					*6800 *14,600	4050 8650	4400 9450	2600 5550	*1950 *4300	8.22 26.98
Ground Line	kg lb			*5450 *12,550	*5450 *12,550	6800 14,550	3800 8200	4300 9150	2500 5300	*2250 *4900	7.87 25.81
-1.5 m -5.0 ft	kg lb	*5250 *11,750	*5250 *11,750	*9500 *21,750	7150 15,300	6700 14,350	3750 8050	4250 9050	2450 5200	*2750 *6100	7.12 23.30
-3.0 m -10.0 ft	kg lb	*9600 *21,550	*9600 *21,550	*10 050 *21,700	7300 15,700	6750 14,500	3800 8200			*3150 *6800	5.79 18.80
-4.5 m -15.0 ft	kg lb			*7000 *15,400	*7000 *15,400					*5000 *11,300	4.08 12.70

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.

Reach Boom Lift Capacities



Load Point
Height



Load at
Maximum Reach



Load Radius
Over Front

















Load Radius
Over Side

R2.6 STICK – 2600 mm (8'6")
BUCKET – 0.73 m³ (0.95 yd³)

UNDERCARRIAGE – Long
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")















		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1650 *3650	*1650 *3650	6.28 20.16
6.0 m 20.0 ft	kg lb							*2900 *5900	*2900 *5900			*1500 *3300	*1500 *3300	7.53 24.49
4.5 m 15.0 ft	kg lb							*3600 *7850	2900 6150			*1500 *3250	*1500 *3250	8.23 26.91
3.0 m 10.0 ft	kg lb			*7650 *16,300	*7650 *16,300	*5150 *11,050	4450 9550	*4150 *9050	2750 5900	*2900 *5450	1800 3850	*1550 *3350	1450 3150	8.55 28.03
1.5 m 5.0 ft	kg lb			*5550 *13,350	*5550 *13,350	*6500 *14,000	4100 8750	4400 9450	2600 5550	3050 6500	1750 3750	*1700 *3650	1400 3050	8.54 28.02
Ground Line	kg lb			*5850 *13,500	*5850 *13,500	6800 14,550	3850 8250	4300 9150	2450 5300	3000 6550	1700 3750	*1900 *4200	1450 3200	8.20 26.91
-1.5 m -5.0 ft	kg lb	*4850 *10,850	*4850 *10,850	*8950 *20,400	7100 15,250	6700 14,300	3750 8000	4200 9000	2400 5150			*2350 *5200	1700 3750	7.49 24.53
-3.0 m -10.0 ft	kg lb	*8400 *18,900	*8400 *18,900	*10 550 *22,800	7250 15,550	6700 14,400	3750 8100	4250 9100	2450 5250			*3300 *7350	2350 5250	6.26 20.37
-4.5 m -15.0 ft	kg lb			*8000 *17,000	7550 16,250	*5200 *11,400	3950 8700					*4900 *10,800	3800 8600	4.65 14.92

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R3.1 STICK – 3100 mm (10'2")
BUCKET – 0.59 m³ (0.78 yd³)

UNDERCARRIAGE – Long
SHOES – 700 mm (28") triple grouser

BOOM – 5100 mm (16'9")

		1.5 m (5.0 ft)		3.0 m (10.0 ft)		4.5 m (15.0 ft)		6.0 m (20.0 ft)		7.5 m (25.0 ft)				m ft
														
7.5 m 25.0 ft	kg lb											*1400 *3150	*1400 *3150	6.85 22.07
6.0 m 20.0 ft	kg lb							*2850 *6250	*2850 *6250			*1300 *2900	*1300 *2900	7.98 26.01
4.5 m 15.0 ft	kg lb							*3250 *7050	2950 6350	*2350 *4500	1950 4100	*1300 *2850	*1300 *2850	8.64 28.27
3.0 m 10.0 ft	kg lb			*6350 *13,950	*6350 *13,950	*4550 *9850	4550 9800	*3850 *8300	2800 6000	3150 *6500	1850 3950	*1350 *3000	1350 2900	8.94 29.32
1.5 m 5.0 ft	kg lb			*9700 *21,250	7750 16,650	*6000 *12,950	4150 8950	4450 9550	2650 5650	3050 6550	1800 3800	*1500 *3250	1300 2800	8.93 29.32
Ground Line	kg lb			*6950 *15,900	*6950 15,350	6800 14,600	3850 8250	4300 9200	2500 5300	3000 6400	1700 3650	*1750 *3800	1350 2950	8.62 28.27
-1.5 m -5.0 ft	kg lb	*4700 *10,450	*4700 *10,450	*8850 *20,100	7000 15,050	6650 14,250	3700 7950	4200 8950	2400 5100	*2950 *6450	1650 3650	*2150 *4700	1550 3350	7.95 26.04
-3.0 m -10.0 ft	kg lb	*7500 *16,850	*7500 *16,850	*11,100 *23,950	7100 15,200	6650 14,200	3700 7900	4200 8950	2400 5100			*2950 *6600	2000 4450	6.82 22.23
-4.5 m -15.0 ft	kg lb	*11,400 *25,800	*11,400 *25,800	*9100 *19,450	7350 15,750	*6050 *12,850	3800 8200					*2850 *6900	*2850 *6900	4.92 15.81

* Limited by hydraulic capacity rather than tipping load. The above loads are in compliance with SAE hydraulic excavator lift capacity rating standard J1097. They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity. Weight of all lifting accessories must be deducted from the above lifting capacities.